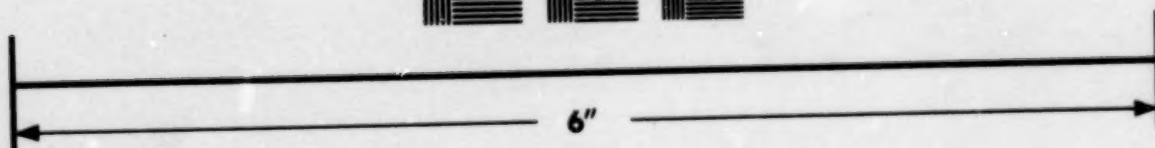
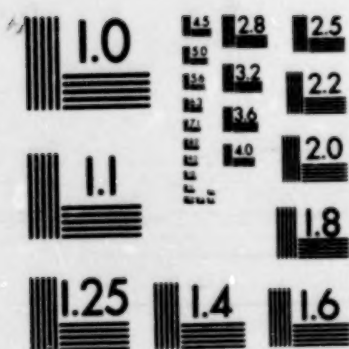


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FOREIGN MILITARY REVIEW

No 12, DECEMBER 1986

4 AUGUST 1987

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SOVIET UNION
FOREIGN MILITARY REVIEW

No 12, DECEMBER 1986

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EDITORIAL ADDRESSES QUESTIONS ON RESTRUCTURING IDEOLOGICAL WORK

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 3-6

[Editorial]

[Text] The entire life of our Motherland, the creative activity of the Communist Party and Soviet people, the combat training and service of army and fleet personnel are developing under the mighty influence of the decisions of the 27th CPSU Congress. Successful realization of them in practice depends upon the activation of the human factor of responsibility, the desire to think and work in a new way, the living creation of the workers and of the armed defenders of the country.

"Today the most essential thing on which the full force of Party influence must be focused," it was emphasized in the Political Report of the CPSU Central Committee to the Congress, "is the attainment by each person of an understanding of the seriousness of the times in which we live and their pivotal nature. Any plan of ours will be up in the air if it leaves people ambivalent and if we are unable to rouse the labor and social activeness of the masses, their energy and initiative."

Now, often the June (1986) Plenum of the CPSU Central Committee, when the preliminary results have been summed up and specific lessons drawn, there is a great deal that says that the ideas of the Congress are firmly entering the public consciousness and objectively preordain the irreversibility of the processes taking place. Positive changes are taking place in the economy, social relations, and spiritual life. Glasnost is expanding, and the most burning problems of the country's development and democratization of society are being discussed openly. There is a growing battle for social justice and against unearned income, drunkenness and alcoholism, and other negative phenomena.

The Soviet people are responding warmly to innovative undertakings, support them and decisively come out in favor of restructuring having universal and business-like nature. Restructuring is the first and necessary step on the way to carrying out our program tasks: achievement of a new qualitative state in Soviet society on its way to accelerating the country's socio-economic development. At present, it encompasses all aspects of public life, beginning

with the economy and ending with the work style of cadres and all Soviet people.

In the course of restructuring, Comrade M. S. Gorbachev noted at the National Conference of Social Science Department Chairmen, "There is a pointed, and not always open, though uncompromising struggle of ideas, psychological tenets, styles of thinking and conduct going on." The turn to quality and efficiency, to new leadership methods is difficult and painful. In many places everything remains as before: initiative comes up against a well of indifference, and against open resistance at that.

We must make it an axiom that you will not solve new problems with old methods and approaches. Everyone must be made over. Restructuring, that is the vehicle which must help to avoid serious shortcomings and omissions. For that reason, this inherently irreversible process must go on from top to bottom. Each of us must look exactly at his position and the return on his labor activity, and evaluate his contribution to the common cause of acceleration.

The Party demands confirmation in all Party organizations of an atmosphere of intolerance to shortcomings, stagnation in work, ostentation, and idle talk, placidity and dependence. To struggle with these and other negative phenomena requires us to strengthen the critical mood in the spirit of the 27th Congress. Principled criticism is needed which has a specific target and reveals the causes of shortcomings and methods to remove them, and supports a spirit of anxiety and a healthy dissatisfaction with what has been achieved.

In carrying out restructuring, the Party places questions of normalization of the moral-psychological atmosphere in the country, in Party organization and in collectives, high on its agenda. Therefore, work with people is placed high on the agenda. Only by putting the individual at the center of Party work, it was noted in the June (1986) CPSU Central Committee Plenum, can we solve the problems raised by the Congress. The main point of restructuring lies in turning to the people, to a living cause.

Emphasis on qualitative indicators, on a maximum conjunction with life and, in addition, on informal, intelligent, and honest discussion with people, on one-on-one work with the individual, and rejection of empty exhortation; that is the most important requirement of restructuring work on the communist socialization process of the workers.

The CPSU sees the main point of ideological work, as recorded in the Party Program, to be socialization of the workers of our country in a spirit of an ideological bent and dedication to communism, Soviet patriotism, and proletarian and socialist internationalism, a conscientious relation to labor and public property, and even greater access of the masses to the treasures of spiritual culture, eradication of morals and manners which contradict the socialist way of life.

The distinctiveness of the present stage of development of Soviet society gives special urgency to problems in the spiritual realm and an elevation of peoples' consciousness. We are talking about giving all ideological activity a truly creative and inventive nature. It must be marked by the depth of its

ideological-creative content, a complete and exact accounting of the reality of domestic and international life, of the growing spiritual interests of the workers, closeness to people, veracity, an inquiring nature, and specificity. Ideological work must facilitate the activization of the human factor.

The essence of ideological support of activization of the human factor in the armed forces lies in an in-depth study of the decisions of the 27th Party Congress by Soviet soldiers, and explanation to the personnel of the permanent significance of the course toward accelerating the country's socio-economic development for improving socialism and the defense of the Motherland. Ideological work calls for helping every serviceman to realize that today he must serve with greater exertion of efforts and energy, to achieve a fundamental improvement in study scores, service and discipline, to conduct a creative search for ways to elevate one's combat readiness, and carry out one's military duty with initiative and conscientiousness.

Among the troops and in the fleet there already are a few collectives where the innovative spirit more fully permeates ideological-socialization work, where combat propaganda aids the soldiers to contemplate more deeply the tasks before them and gives rise to initiative, energy, and a desire in them to work with full exertion of effort, where the soldiers' growing consciousness is reinforced by concrete successes in service.

The chief result produced in socializing people is the firm establishment of the personnel's moral-political condition, their solidarity in support of the Communist Party and its Central Committee, their undivided support of the domestic and foreign policy of the Soviet state, conscientious execution by the great majority of soldiers of their patriotic and internationalist duty.

Political study is one of the leading means of forming a world view, high ideological-political, moral-combat, and psychological qualities of Soviet soldiers. Its level of organization and content must correspond to the spirit and demands of the time. Today it is already clear that political study calls for supporting a profound understanding by the personnel of the CPSU 27th Congress's decisions in an organic linkage with consistent study of the classical legacy of Marx, Engels, and Lenin, of pressing problems of military theory and practice, of defense of the socialist Fatherland.

Qualitative improvement of the political training of the personnel must, to a large degree, be accomplished through actualizing the content of political study, strengthening its practical direction, tying theory to the soldiers' lives, and be personified in the concrete acts of the soldiers. In all forms of political study, it is important to see that theoretical knowledge be transformed into profound personal convictions and that they demonstrate themselves in selfless performance of a soldier's duty, positive, moral actions and exemplary conduct.

With all its importance, political study cannot replace the full diversity of ideological-socialization influence on the personnel. Its combination with various forms of agitation-propaganda, mass propaganda and mass political work makes the spiritual life of the unit or ship richer and more interesting.

The experience of recent years convincingly attests to the fact that an efficient solution of the problems of ideological work, in many ways, is aided by strengthening its moral direction. The principles and norms of Communist morality in our soldierly activity are confirmed in the active struggle against that which hinders us from living and serving the Motherland in a worthy manner--violations of military discipline, drunkenness, etc. Similar amoral phenomena are most often a consequence of the emptiness of one's inner world, smallness of one's interests, and lack of clear direction in life. It is well known that discipline is a political and moral category. And that means that strengthening it is impossible without further improvement of the political, legal, and moral socialization. The serviceman's disciplined nature is one of the indicators of his spiritual maturity, and his ideological and political consciousness.

Among the many qualities nurtured in Soviet soldiers, patriotism and internationalism acquire special significance with contemporary conditions. "The Party," it was recorded in the CPSU Program, "will further work tirelessly so that love of the Motherland of the October Revolution, the land where he was born and grew up, pride in the historical achievements of the world's first socialist state, are combined, in every Soviet man, with proletarian and socialist internationalism, a sense of class solidarity with the workers of fraternal countries, with everyone who struggles against imperialism and for social progress and peace." The Party views faithfulness to one's patriotic and internationalist duty as one of the elements of the combat potential of the Soviet Armed Forces.

Patriotism and internationalism are qualities inherent in Soviet soldiers. In addition, confirmation of patriotism and internationalism even today demands great purposeful educational work. The international essence of the Soviet Armed Forces is being augmented by new content. For multinational military collectives to be internationalist, we need great effort in the education of people, amelioration and support of the relations among them based on the friendship and fraternity of the USSR's peoples, and on a profound understanding of the formation of the nature of socialist internationalism. It is important to consider in our work the peculiarities of the national psychology, history and cultures of the peoples, and to employ tact and sensitivity. The formation in each soldier of the readiness to defend peace and socialism, in unified combat rank with the fraternal armies of the Warsaw Pact member countries, plays a special role under present conditions. Soviet soldiers must be ready to offer all-around support to peoples struggling for their national and social liberation, in imitation of the example of soldiers and officers who are coming to the aid of the Afghan people in defense of the April revolution.

The effectiveness of ideological work, under present conditions, in many ways is determined by the nurturing of ideological stableness in servicemen; intolerance toward bourgeois ideology and morals. Today, the question should be posed only this way: in a military environment there can be no place for political immaturity and naivete, or for instances of loss of class feelings. Now, as never before, with still greater urgency, the task arises for an inquisitive unmasking of the aggressive nature of the ideology and policies of imperialism, of the consistent defense of our class positions, the ideals and

spiritual values of socialism, nurturing of strong political vigilance in the soldiers.

The interests of increasing the political tempering of young people in the army and navy require us intelligibly and convincingly to unmask ideological sabotage, show what actually stands behind the shining facade of "the free world," to help the soldiers examine the lies of western "well wishers." Organization of the unmasking of hostile ideas and subversive actions require of ideological workers high professionalism and imparting to our propaganda a bold and creative nature and combat aggressiveness. Aggressiveness is necessary for rebuffing sudden ideological attacks and bringing to the broad masses truthful information on the real achievements of socialism and the socialist life style.

The effectiveness of ideological work, in many ways, directly depends upon the ideological cadres. The Party decisively demands improvement of the selection, placement, training and socialization of staff and roving propagandists and elevation of the level of their theoretical preparation and methodological skill.

The propagandist is the central figure in the organization of ideological work. He is linked with the soldiers by living, firm ties and influences them, not on the strength of authority, but by an impassioned Party word going to the hearts and minds of each person. And that word will be ponderable if the propagandist profoundly knows his business, is devoted to it with his whole soul, and, in full measure, has mastered the ideological-theoretical wealth of the material of the 27th CPSU Congress.

Restructuring of ideological work in the USSR Armed Forces is a multiple-plan process. It requires an evaluation of the past as was done at the 27th Party Congress.

THE FIRST LESSON is the lesson of truth. Communists in the army and navy, and all the most ideological and propaganda activists received a remarkable example of the necessity to call a spade a spade, for everyone to speak directly and openly, honestly and with principle. Therefore, today as never before, it is important to intensify criticism and self-criticism, to combat ostentation and conceit, to create a business-like mood in military collectives, not to fear to reveal the true state of affairs, to take effective measures to remove shortcomings.

THE SECOND LESSON is single-mindedness and decisiveness in practical activities. Business-like efficiency, unity of word and deed; that is what determines the success of ideological work. Without an understanding and realization of this truth, no form of restructuring, no kind of change, can take place. Concern for the unity of word and deed must be raised to a basis of principle. People will then see and sense in greater perspective, and, from personal experience, be convinced of the great force of our ideology, when they will see actions behind words, organization behind exhortations and mottoes, execution behind decisions, fulfillment behind promises. Only on this basis will the belief of each person, in our ideas and social values, be strengthened. Key on actions, not on words, that is the Party's demand. Only

a genuine case and good end results can crown these high ideas in a worthy manner.

THE THIRD LESSON is that success in any matter, to a decisive degree, depends upon how actively and conscientiously the masses participate in it. And that means, that to achieve success, one must shift his basic efforts in ideological work to the lower-level collectives, where the success of training and education is decided. It is important to organize the participation the broadest lower-level aktiv in the popularization and explanation of the decisions of the 27th CPSU Congress; to inspire the innovative spirit of the Congress in the life of military collectives; to guide them in solving the problems of combat readiness, strengthening military discipline, and schooling the soldiers in the complex conditions of the present international situation.

When organizing ideological work in a new way, it is vital to remember as well that a serious obstacle in ideological-educational work is still the "gross" clerical approach encountered to evaluating its results, when the number of measures taken and the range of people involved cannot be taken as the most important criterion of effectiveness.

The great possibilities of ideological work are often not realized as a result of poor organization. We have to establish that the living interesting cause is drowning in formalism, which had permeated the style and methodology of the activities of a certain part of the command-political cadres and propagandists.

An indifferent attitude toward people, their needs and demands, causes serious harm to ideological work. In some places they give no thought to the fact that no mottoes, exhortations, and sword oaths to improve combat training, will be realized if disruptions in the exercises, simplifications and indulgences are permitted and a high level of the leader's theoretical and methodological skill is not assured.

Ideological work has called for spirited support of our acceleration, and rallying the people around the Party, to form a communist type of personality, to assure an armed defense of the gains of socialism. Therefore, today it is important profoundly to comprehend the further creative development of Marxist-Leninist theory, to refine and formalize one's tasks considering the peculiarities of the present stage of restructuring and acceleration of the development of our society. But, all this is not an end in itself, but one of the means to secure fulfillment of the demands of the 27th CPSU Congress. The main point of our work is to activate the human factor, assure maximum demonstration of the physical and spiritual possibilities of Soviet people and the soldiers of the army and navy.

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ASEAN IN U.S. ASIAN-PACIFIC POLICIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 7-11

[Article by LtCol I. Volgin; "ASEAN in U.S. Asian-Pacific Policies"]

[Text] After the Second World War, Southeast Asia became one of the most "turbulent" areas of the world, where military conflicts and sources of dangerous tension, which had seriously poisoned the international political atmosphere, developed one after another. Especially, many tragic experiments, sufferings and grief throught the fault of imperialism and reaction fell to the lot of the people of Indochina. The defeat of the American militarists, the victory of the forces of peace and socialism in Indochina in the mid-70s, led to serious changes in the order of forces in the region, and created preconditions for the peaceful development of all the Southeast Asian states, and the alignment of ties and mutually-advantageous cooperation between them. But, unfortunately, the realization of these preconditions has not been achieved to this time. One of the main sources of instability and tension, surviving to this day in Southeast Asia, and even in the Asian-Pacific region as a whole, is the fact that the present administration of the U.S. does not desire to accept the ignominious defeat and loss of its positions in Indochina and refuses to abandon the unachievable, but dangerous plans to achieve economic, political and military hegemony in this part of the world. Striving to turn back the course of historical development, Washington embarked on a course of forcing confrontations between the Indochinese socialist countries and other asiatic governments, while strengthening its own political influence and military presence here for the purpose of realizing global anti-Soviet, anti-socialist schemes.

The Association of Southeast Asian Nations (ASEAN) was assigned an important place in U.S. "neo-global" policies in this region of the world. Considering all of Southeast Asia and the Pacific Ocean region as a whole, as the "eastern front" in the struggle against the socialist countries, Washington considers ASEAN as one of the most important participants in that "front." Hence the attempts to subordinate to its own control the countries entering it and to transform this political-economic organization into a military cluster, associated with the U.S. and its allies.

We would remind you that ASEAN was formed in 1967, with Indonesia, Malaysia, Singapore, Thailand and the Philippines as members. In 1984, Brunei became a member. Assistance to economic growth, social progress and cultural development of the member countries is proclaimed as the organization's official goal. However, from the very beginning of ASEAN's formation, Washington has strived to add an anti-communism, militaristic trend to its policies and to use the association for the struggle with socialism and the national-liberation movement in Asia, and also in a global anti-Soviet strategy.

The victory of the Indonesian people compelled ASEAN's leadership to take a new look at future regional development. This found its own reflection in their attempts to isolate themselves from the aggressive policies of the U.S. which had become bankrupt. The initiatives of the governments of Vietnam and Laos regarding the alignment of relations with the ASEAN countries, were seen as helpful in the overall state of the situation in the region at that time. The widening of the association's members cooperation with socialist states and stirring up their participation in the non-alignment movement promoted the strengthening of ASEAN's foreign policy and economic position.

Such development of events had to be clearly not to the liking of the U.S. top leadership, who, still not recovered from the shameful downfall of the Indonesian gamble, again began to nurture plans for forcing their strategic forces in the region. With the present administration's accession to power, the American's course in Southeast Asia was made more active. Now, in Washington, they consider it not only as an important link, connecting the chain of U.S. bases located in the Indian and Pacific Oceans, but also as a new bridgehead for the deployment of American forward-based forces.

The task of providing for the interests of American monopolies is playing the final role in the development of U.S. Asian-Pacific policies. Suffice it to say that the volume of trade with the countries of the Pacific basin comprises 30 per cent of the U.S.'s total foreign trade turnover and exceeds the volume of their trade with countries on the European continent.

American firms and corporations make use of the services of the country's numerous scientific centers and organizations which publish in large quantities various types of research and analytical reviews on the problems of the economic and military-political situation in the Asian-Pacific region. Attention to it became evident on the part of U.S. ruling circles. President Reagan, in 1983, declared the "offensive of the Pacific Ocean era," and the Secretary of State, G. Shultz, in 1984, made an announcement concerning the "shift of the center of world economy from the Atlantic to the Pacific Ocean area."

During the indicated period, the American leadership more actively "pushed" the idea of the formation of a so-called "Pacific Ocean Association," a reserved regional grouping, the originally suggested makeup of which was to include the U.S., Canada, Japan, Australia, New Zealand, South Korea, and the ASEAN countries. In Western specialists' opinion, apart from the political and economic considerations, the White House's strivings to create such an

association was brought about by strategic schemes to use it as a military-political unions with anti-Soviet and anti-socialistic goals.

The U.S., since the end of the 70s, has been using the exaggeration of the so-called "Kampuchean problem" as still another "appropriate pretext" for military-political pressure on ASEAN. Having embarked on the course to consciously frustrate the process of political regularization of the situation around Kampuchia, American imperialism, in full measure, is dividing the responsibility for this "undeclared war," which it has been conducting against the NRK (Peoples Republic of Kampuchia) for eight years. While artificially arousing seeds of discord among the Indochinese countries and their neighbors, members of ASEAN, the U.S. openly provides weapons and money for the bands of Khmer reaction, located in the border areas of Thailand and encourage participation of the Thailand border units in armed provocation against Kampuchia. By Pentagon standards, Thailand falls in the category of a "front-line state," while in fact, it has been transformed into an advanced bridgehead in imperialism's struggle against the socialist countries of Indochina.

The intimidation of ASEAN members by "encroachment from without," "Soviet," and "Vietnamese military expansion," is the means widely used by the U.S. for carrying out its foreign policy strategy in Southeast Asia. American "appraisals" of the causes for the present situation in the region, in which Vietnam and the Soviet Union appear as the "sources of all trouble," are actively being propagated in the social-political and military circles of the ASEAN countries. This is being done with the help of mass-information resources, in open and closed seminars, symposia which are being conducted recently one after another, as a rule, on the initiatives of Americans in state capitals of the association members.

Psychological pressure on the governments of these states is being brought to bear by the Washington administration with quite utilitarian goals: it is striving to create favorable political conditions for building up an American presence in the region, and to induce the ASEAN countries to adopt, as welcome, U.S. foreign and military policies.

Recently, Washington made more active the efforts to broaden American military presence in the Pacific Ocean area. According to Western press information, at the beginning of 1986, the U.S. Navy in that region numbered 220 ships, or 40 per cent of the total number of navy ships. By 1989, their number in the Pacific should be increased by still 70 more units. The program to build up U.S. nuclear forces in the region is especially dangerous. Besides the nuclear munitions already on the SEVENTH FLEET ships, they are beginning to deploy on them TOMAHAWK cruise missiles, a significant part of which will be equipped with nuclear warheads. Assuming the possibility of "limited" use of nuclear weapons in the Far East, the Pentagon actually is converting the Asiatic nations to U.S. nuclear hostages.

Although the anti-Soviet aspect in American strategy stipulates a domineering role of the Far East region in U.S. militaristic preparations, in the Pentagon they consider that American "military supremacy" in the Pacific must bear a universal character. The development of military plans originates from the

interrelated situation in Northeast and Southeast Asia, on account of which it is envisioned to build up the operational activity of the American fleet and air force in Southeast Asia in order to strengthen control over the sea and air lines of communication connecting the Pacific and Indian Oceans.

As is well known, the United States has succeeded in extending the term of the leases of the military bases in the Philippines, two of which, Clark Air Base and the naval bases at Subic Bay, are the Pentagon's largest forward bases overseas. More than 15,000 American airmen are stationed here and nuclear weapons are kept here. U.S. attempts to expand its opportunities for using the territory of Thailand and the military objectives on it have been strengthened. Specifically, an agreement in principle has been reached concerning the construction here of large ammunition depots for storing American munitions. These weapon arsenals are intended to support the conduct of operations in Southeast Asia by the "Rapid Deployment Forces" during so-called "emergency circumstances." U.S. military aircraft have been using continuously the former American air base at Utapao since 1981.

The reactionary press persistently misconstrues the goals of Soviet policy in Asia and intimidates the ASEAN countries with some "insidious Russian plans" in the region. Speculation apropos the "swift growth" of the power of the Soviet Pacific Fleet, the use of bases by them in Indochina countries, etc. are favorite arguments of the authors of the myths concerning the "Soviet threat." However, this "reasoning" does not withstand the slightest criticism by a comparative analysis of the goals and nature of Soviet and American policies in the given area. If, from the Soviet Union's side, the policy in the sphere of security bears exclusively a responsive character and is dictated by the necessity to withstand the U.S.'s military challenge to world socialism, then Washington's true goals, and they do not deny this, consist of achieving absolute military-strategic superiority over the USSR on the "eastern flank," keeping the development of the political situation in the countries of Southeast Asia under American control, pleasing the interests of United States transnational corporations, and, with the help of military presence, exerting pressure on the ASEAN countries' policies.

Many times, the Pentagon has suggested various plans for military integration in ASEAN. For example, a suggestion was made concerning setting up multilateral cooperation between the association countries' navies, and concerning the creation of a joint command for SLOC (sea lines of communications) protection. As a subsequent stage, it was candidly suggested going to the creation of a treaty system for regulating military cooperation with joint armed forces of the association's member countries, that is, actually to building a military bloc. The possibility of forming an ASEAN "Rapid Deployment Force," to carry out gendarme functions was considered.

The foreign press recognizes that a refined system of ideological and propagandistic influence on the shape of the thinking of the military and ruling circles of ASEAN, on the part of the U.S., undoubtedly, will leave its mark. The policies of a number of the association's countries, in their relations with North Vietnam, Laos, and North Korea, are as before, rigid and even hostile. The mass information resources of these countries often directly copy the anti-Soviet and anti-Vietnam cliches of imperialist propaganda, with

no grounds for a militaristic psychosis. Under American influence, the military expenditures of ASEAN members has continually grown. They have increased, on the average, over the past five years, by 12-15 per cent and reached, by 1985, 8.5 billion dollars. In Thailand, they comprise 24 per cent of the budget appropriations, and in Singapore, 15.5 per cent.

The enormous size of the individual ASEAN countries' foreign debts is directly connected with the purchase of expensive munitions in the U.S. and other Western countries. The cost of only one contract, concluded by Thailand with the United States for the purchase of 12 F-16 fighters, exceeds 300 million dollars. The delivery of weapons is carried out by Washington and its allies in NATO and the other ASEAN countries. During the past five years, the volume of these deliveries has grown by a factor of 2.5, and is valued at 3 billion dollars (of them 900 million dollars are due in 1986). International arms fairs, being organized practically annually in the capitals of the ASEAN countries "work" in the arms race in Southeast Asia.

Skillfully using the delivery of weapons, the Pentagon is striving to promote the tendency, by the ASEAN countries, to purchase common or similar weapon systems and additionally, strengthen the military-technical ties between ASEAN countries. As the chairman of the association's permanent committee announced in 1983, "standardization of weapons in ASEAN has become a fact."

The U.S. encourages, in every possible way, other forms of military cooperation of association members, bilateral training, and the exchange of military information and experience. Foreign reviewers note that joint maneuvers of the armed forces (types and arms of service) of Thailand and Malaysia, Thailand and Indonesia, Malaysia and Singapore, Malaysia and Indonesia, Indonesia and Singapore have been conducted recently on a regular basis, and have permanent code names.

Of course, it would be incorrect to consider that the ASEAN governments are obediently following the lead of Washington's militaristic policies in everything. In several cases, (including those discussed above) they were actually forced to do this owing to the force of this or that circumstance, primarily of an economic character. A community of common interests is taking shape, especially as it concerns the propaganda of several official publications of ASEAN countries of the distorted conceptions concerning socialist states and their foreign policy. However, foreign specialists consider that the leaders of the association countries hold to various views on a number of key Southeast Asian problems. The association's conservative circle, represented mainly by Thailand and Singapore, occupies the most implacable position on relations with the socialist countries of Indochina. In Thailand, the military, which occupies the most important government posts, plays no small role in the formulation of these views. It is not out of place to mention that many high members of the Thailand Army were educated or went through training in the U.S.

At the same time, countries of the moderate ASEAN circle, Indonesia, Malaysia and also the Philippines, display an even greater understanding of the danger of the risky direction in which the U.S. and its accomplices are pushing the

association. In them, although not often and with reservations, the thesis concerning the "Vietnam threat" is regarded with scepticism.

The USSR's policy in Asia has begun to be more realistically appraised. In the spring of 1986, during the meeting of the foreign ministers of the "six" with President Reagan on the Island of Bali, he was told that the association did not share Washington's opinion that "the increase in the Soviet military threat in the region" is a great source of danger for the states located there. Judging by information in ASEAN countries' press, an even greater number of people connect the anxiety for the future of their countries not with the notorious "Soviet threat" but with the real growth of U.S. military presence in Southeast Asia.

The leaders of the ASEAN countries have regarded the American idea concerning a "Pacific Ocean Association" rather coolly, having discovered in it the possibility of an increase in U.S. dictates in the association's attitudes. Washington's noticeable anxiety caused an announcement, made in the summer of 1986, concerning the intention of its participants to create a nuclear-free area in Southeast Asia. The realization that such an idea could place Americans in an extremely embarrassing position because the announcement of the nuclear-free zone could impose on the U.S. at least the moral responsibility to eliminate nuclear weapon reserves, stored at their Philippine bases. It also could deprive the American SEVENTH FLEET and aviation of the possibility of free use of ports and airfields of the ASEAN countries and to plot a course in their territorial waters. It was not surprising that the first reaction of official Washington was the undiplomatic abrupt announcement of Secretary of State, Shultz concerning the fact that the U.S. is not planning to remove its nuclear weapons from the Pacific basin.

The positive tendencies in the ASEAN countries' policy forces one's way in the difficult struggle with internal and foreign reactions against American dictates and interference in the association's affairs. They came into existence to a considerable extent under the influence of the sweeping democratic movement, recently unfolding in these states. It is difficult to overestimate then, the significance which a new broad-scale initiative of the USSR, the complex program of providing international security in the Asiatic-Pacific region, formulated in a speech of the general secretary of the CPSU CC, M.S. Gorbachev in Vladivostok, has for the fate of Asia. That program is another illustration of the fact that the Soviet Union stands for a peaceful, equal in rights, and mutually-beneficial cooperation with all the Asian states, including the ASEAN countries.

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TURKISH ARMED FORCES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 11-19

[Article by Capt 1st Rank V. Burlyayev; "The Turkish Armed Forces"]

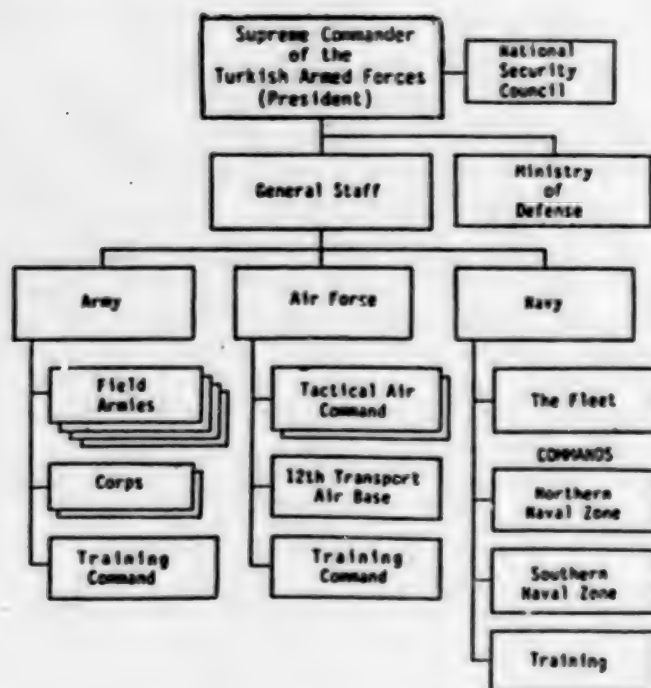
[Text] Turkey, having a land border with the Soviet Union and Bulgaria, has great strategic importance in the Mediterranean and Middle East region. Foreign military specialists pay attention to the extremely important Black Sea peninsulas, which is reflected in the plans of the leaders of the North Atlantic bloc. Therefore, Turkey was drawn into two military blocs: into NATO in 1952, and three years later into CENTO (disbanded in 1979). It justified the calculations of its NATO partners, contributing to the NATO armed forces almost all of its army, a majority of its air force and its entire navy.

In developing and training the Turkish armed forces, as emphasized by Western specialists, decisive influence is wielded by the Pentagon and NATO commanders. For example, the Joint U.S. Military Mission (JUSTMAT), which has been in Turkey since 1947, has its detachments and advisory groups in the general staff, the service staffs, field armies, and tactical aviation commands. Operational command of the Turkish armed forces in the NATO system is accomplished by headquarters which are dispersed around the country: combined NATO ground forces in the southeastern part of southern Europe (Izmir), 6 ATAF (Izmir), and NATO navy in the northeastern part of the Mediterranean (Ankara).

In recent years, the significance of Turkey in the militaristic plans of the U.S. and NATO has grown even greater. The country's leadership, having attained power as the result of a military coup in 1980, has, at various times, given the United States the right to use about 60 bases and facilities on Turkish territory which are designed primarily for actions against the Soviet Union, and has increased the activities of its armed forces in the bloc.

Being an active member of NATO and fulfilling its responsibilities in the organization, Turkey maintains a large standing army force of about 630,000 troops. They consist of the army, air force and navy (see diagram).

An important part of the Turkish armed forces is the police force (125,000). It is responsible for the defense of the land borders and for providing "public safety" in the country.



Turkish Armed Forces Organizational Structure

SENIOR COMMANDS. The high commands of the army and navy which control the armed forces, also play a similar role in the political life of the country. In September 1980, the military command carried out a coup and formed a Council for National Security (CNS), which holds all power in its hands. This body, even in the opinion of the bourgeois press, is the highest ruling institution where all affairs are controlled by the military. The military administration, headed by the chief of the general staff, K. Evren, and acting in the interests of the ruling class, has delivered a blow to the democratic movement and initiated the reconstruction of the entire political system toward centralized power.

Under control of the generals, at the end of 1982, a new constitution was adopted, giving the government sweeping legislative and executive powers. The president became the supreme commander of the armed forces and chairman of the CNS. Cabinet responsibilities were given to a high military council, whose membership, as opposed to the CNS, includes not one civilian member of the government. The chairman of this council is the chief of the general staff and the permanent members are the commanders of the services, and all commanders, with the rank of army general. Periodically, representatives of the ministry of defense, army commanders, commanders of certain divisions are invited to meetings of the council.

The commander (in wartime, the supreme commander) of the armed forces is the chief of the general staff, appointed by the president upon the recommendation of the council of ministers. He bears full responsibility for their condition, organization, and combat readiness. The commanders of the services and the police forces are directly subordinate to the chief of the general staff.

The principal tasks of the general staff (located in Ankara) are the development of recommendations to the government on matters of organizing the armed forces, developing operational plans in case of war, and the day-to-day leadership of the armed forces. The structure of this highest military entity periodically undergoes changes, but the main components are retained; the main directorates (personnel, operations, reconnaissance, support, electronics and communications) and special directorates and departments.

The Ministry of National Defense, headed by civilians, has no direct connection with the training and combat activities of the armed forces. Its functions include the material-technical support of all branches of the armed forces, drafting, training and refresher training for reservists, building mobilization reserves, preparing the national territory as a theater of operations, and administrative functions. The ministry consults the military councils.

With the goal of establishing closer working relationships, all three service staffs are located in Ankara.

THE ARMY is the basic and largest branch of the armed forces, amounting to over 82 per cent of the total number (520,000 personnel, of which 475,000 are regulars).

The army is formed into: 17 divisions, 14 infantry (infantry and also infantry types A and B), 2 mechanized and armor, 23 independent brigades: 6 armor, 4 mechanized, 11 infantry, airborne and reconnaissance (commando); and separate units with central assignments.

All of the named units are united in four field armies and two separate corps. Also, there is a training command and two internal zone commands, to which the training divisions and brigades, as well as material-technical support units are subordinate.

Indirectly subordinate to the commanders of the field armies and corps are the missile and air defense battalions, engineer regiments and battalions, signal regiments and battalions, and army aviation, as well as rear support organizations. Specifically, as reported in the foreign press, there are 4 battalions of HONEST JOHNS, about 30 battalions of field artillery (203.2-mm) howitzers, 175-mm SP cannons, 155-mm howitzers and cannons), up to 20 air defense battalions, 3 engineer regiments and 20 engineer battalions, 3 regiments and about 10 battalions of army aviation, and 3 signal regiments and 12 signal battalions.

Overall operational command of the army is accomplished by the commander (an army general), who is appointed for two years by the council of ministers on

the recommendation of the chief of the general staff and the minister of defense, and confirmed by the president of the country. He is directly subordinate to the chief of the general staff and bears responsibility for organization of the army, its manning, combat readiness, and material-technical support. The commander commands his formations, organizations and units through his headquarters (in Ankara), headed by a lieutenant general.

The Turkish army is a component of the combined (with American and Greek) armies of NATO in the southeastern part of the Southern European Theater (headquarters in Izmir), the "zone of responsibility," of which includes two zones; the Balkan peninsula and the asiatic part of Turkey. The largest operational element of the Turkish Army is a field army and the highest tactical formation is a corps.

NATO military specialists consider the most important region in the southeastern part of the theater to be the Black Sea straits and Eastern Thrace, bordered by the Greek-Turkish boundary, the western Turkish shore and the Black Sea shore. The terrain on its territory allows the use of practically any branch of forces. Road networks are well developed here. For combat operations in this region, plans call for using the 1st Field Army (headquarters in Istanbul), which includes the 2d, 3d, 5th, and 15th Corps, and combat service support units. Altogether, this organization, considered the best manned and most combat ready, contains 10 divisions and 4 independent brigades.

In the Asiatic part of Turkey, the NATO commanders concentrate the main force in the regions lying alongside the border of the Soviet Union. The terrain there is characterized by difficult relief. The most favorable for combat operations, in Western specialists' opinion, is that in the mountains, such as Chorooh, Kelkit, Kars-Erzindjon-Sivas and Karakose-Mus-Erzincan, comprising the 8th and 9th Corps. Altogether, this army has four divisions and seven independent brigades.

The 2nd Field Army (Malatya) is designated to operate on the southern border of the country. It includes the 6th and 7th Corps (altogether five independent brigades).

The Aegean Field Army (Izmir)(1), formed in 1975, is planned for deployment along the shores of the Aegean and Mediterranean Seas. It includes one division (training) and two independent infantry brigades.

The 4th Corps (Ankara) is located in Central Anatolia and is considered the reserve command for the Army. It consists of three independent brigades, and combat support and combat service support organizations.

The 11th Corps (Cyprus), formed in 1974 for the purpose of ensuring the security of the Turkish-Cyprus community, is stationed on the Island of Cyprus. It includes two infantry divisions (overall about 20,000 personnel). Its armament includes more than 160 M47 and M48 tanks, up to 150 M113 armored personnel carriers, and more than 200 field artillery pieces.

A Turkish division, the principal tactical formation in the Army, comprises regiments and combat support units. It is not as well developed in its organization and equipment as the divisions of the NATO countries in Central Europe. However, Western specialists consider that Turkish divisions are quite capable of conducting combat in their theater. In maneuverability and firepower, Turkish regiments and battalions lag behind other forces, but their combat potential has grown substantially in recent years. Army leadership places great emphasis on increasing maneuverability, firepower, and combat readiness. With this goal, they are equipped with modern American and West German weapons and combat equipment.

An Infantry division consists of the headquarters and staff, three infantry regiments (of three battalions), and one artillery regiment, three battalions (tanks, engineer, and signal), three companies (headquarters, reconnaissance, and antitank guided missile), and the division support. Altogether there are about 12,000 personnel, more than 60 tanks, up to 200 field artillery pieces and mortars, and more than 100 antitank weapons.

A Type A Infantry division has two infantry and one tank regiment, which has two tank and one infantry battalion, It has about 120 tanks. The remainder of its units are the same as in the standard infantry division.

A Type B Infantry division differs from the standard infantry division only in that its infantry regiments have been converted to mechanized (two motor rifle and one tank battalion).

A mechanized division includes a headquarters and staff, three mechanized regiments (in each there are two motor rifle and one tank battalions), a self-propelled artillery regiment, an air defense artillery battalion, three battalions (reconnaissance, engineer, and signal), two companies (headquarters and antitank guided missile), and division support. It has about 13,000 personnel, up to 200 tanks, about 500 armored personnel carriers, more than 150 field artillery pieces and mortars, and more than 130 antitank weapons.

Independent infantry brigades have a headquarters and staff, four infantry battalions, two artillery battalions, an anti-air battery, five companies (headquarters, reconnaissance, tank, engineer, and signal) and the brigade support. Altogether in the brigade are more than 5,000 personnel, more than 25 tanks, about 90 field artillery pieces and mortars, and up to 50 anti-tank weapons.

A independent tank brigade consists of a headquarters and staff, two tank and two motor infantry battalions, two self-propelled artillery battalions, four companies (headquarters, reconnaissance, engineer and signal) and the brigade support. It has about 120 tanks, up to 70 self-propelled artillery pieces and mortars, and about 40 anti-tank weapons. The strength of such a brigade reaches about 5,000.

The airborne brigade and commando brigade have four battalions. The personnel strength of these formations exceeds 3,000.

According to the foreign press, the armament of the army includes: 18 HONEST JOHN missiles, about 3,000 tanks (M47, 48, and LEOPARD-1A3), 2,000 M113 armored personnel carriers, more than 2,200 field artillery pieces, more than 1,800 mortars of various calibers, up to 2,200 recoilless weapons, and 500 COBRA SS-11, TOW, and MILAN ATGM launchers, about 1,200 anti-air weapons, more than 300 aircraft and helicopters, and other weapons.

In their plans for reorganizing the Turkish Army, the leadership is paying a great deal of attention to equipping it with the most modern weapons and combat equipment. Tanks are the first priority. With the help of West German specialists, a tank rebuilding plant has been constructed for modernization of the M47s and 48s (the gas engine has been replaced with a diesel, the 90-mm gun with a 105-mm, a night vision device has been installed, and other work is ongoing). In accordance with a bilateral agreement, the FRG is providing Turkey with M48A2 tanks, LEOPARD-1A3s, MILAN ATGMs, automobiles, engineer equipment, and signal equipment. Self-propelled artillery systems, LANCE guided missiles, M60 tanks, TOW missiles, anti-air missiles and other equipment is expected from the United States.

The Air Force is an independent armed service. At the top is the commander who is directly subordinate to the chief of the general staff of the armed forces. He commands his units and formations through his staff (Ankara). The latter maintains operational control of the air forces, develops plans for employment of aviation, organizes and controls the operational and combat training of the headquarters, units and organizations, decides matters of material-technical support of the air force, and determines the size and readiness of the reserves. In cooperation with the 6th ATAF headquarters, officers from the Turkish Air Force actively participate in the development of plans for control of the NATO air forces in the South European theater, as well as organizing the training conducted by the command for bloc armed forces.

The strength of the Turkish Air Force is 55,000, of which 35,000 are regulars.

The Turkish Air Force consists of two tactical air commands (the Western press calls these tactical air armies), and one training, one air transport group, and supply centers.

The Tactical Air Command (TAC) is the highest operational organization, designed to command air operations on one or two fronts. Its commander is responsible for the combat readiness of units; plans and conducts training; and, in case of war, organizes air operations and coordinates air with ground forces and the Navy. Directly subordinate is the staff, an aviation command group, three to five air bases and support bases. The basic units of the Air Force are squadrons, consisting of 18-20 planes.

The command group is designed for operational leadership of the combat elements organization of coordination with the Army and Navy.

Air bases, as a rule, are mixed, having fighter-bomber, fighter, and reconnaissance squadrons. Organizationally they consist of a headquarters, two or three squadrons, training aircraft, an air defense battalion, and

support groups. The airbase has a permanent station (the air base), and each has an assigned number. During increased tensions or at the start of a war, squadrons are dispersed to spare air fields (each receives one or two). The airbase commander is responsible for the combat readiness and training of the personnel, and the condition of aviation equipment and vehicles.

Training organizations have the mission of infusing young pilots into ranks and refreshing the habits of experienced pilots following long breaks in flying, as well as for conducting weather reconnaissance before flight operations.

The Air Defense battalion protects the air base. It includes a battery of RAPIER missiles, and three mixed batteries of 40-mm cannons and 12.7-mm quad machine guns.

The support group supports combat activities at the airbase and supplies it with necessary items and combat equipment, provides technical service and replenishing for the aircraft and other combat equipment.

The 1st Tactical Aviation Command (Eskishehir) unites four airbases: Eskishehir--the 111th and 112th Fighter-Bombers (F-4Es) and the 113th Reconnaissance (RF-4Es) squadrons; in Murted, the 141st and 142nd Fighter-Bomber (F-104G); in Bandirma, the 161st and 162nd Fighter-Bomber (respectively F-104G and F-5) and Reconnaissance (RF-5A); in Balikesir, the 191st and 192nd Fighter (F-104S) and 193rd Fighter-Bomber (F-104G) squadrons. Also, it includes the 15th NIME HERCULES missile base (Alemdar).

The 2nd Tactical Aviation Command includes three aviation bases: at Merzifon, the 151st and 152nd Fighter-Bomber (F-5A and F-5B trainers); at Erhach, the 171st 172nd and 173rd Fighter-Bomber (F-4E) and at Diyarbakir, the 181st and 182nd Fighter-Bomber (F-100D and F) and 184th Reconnaissance (RF-5A) squadrons.

Altogether the Turkish Air Force, according to reports in the foreign press, has 18 squadrons of combat aircraft: 14 fighter-bombers (attack), 2 interceptor, and 2 reconnaissance, which includes about 450 combat and training aircraft (160 F-104G, 35 F-104S, 80 F-4E, 40 F-100D/F, 90 F-5A, 8 RF-4E, and 27 RF-5A). With the help of the U.S. and other NATO countries, aviation equipment, with ever growing capabilities, is being delivered and the Turkish Air Force is revamping its squadrons (they expect to receive about 160 F-16s), and they are forming new aviation organizations.

The Air Defense Missile Base consists of two groups (battalions) and several support organizations. Each group has a staff, four missile squadrons (9 NIKE HERCULES launchers). These missiles cover the air space of the Black Sea entrance and Istanbul, an important political-administrative center.

The training command in Izmir trains pilots and support personnel for units of the Turkish Air Force. It has the air academy, flight and technical schools, training bases and brigades.

The transport aviation base (Etimesgut) consists of a headquarters, four transport squadrons (the 221st and 222nd in Kayseri, the 223rd and 224th in Etimesgut) and support groups. Its basic missions are the transport of personnel, ammunition and aviation materiel upon dispersal of the combat squadrons to reserve airfields, delivery of material-technical means to the forces by air, and air delivery of paratroopers. The transport squadrons contain C160D TRANSALL and C-130E HERCULES, C-47s, C-54s, BN-24 ISLANDERS, VISCOUNT-700s, and UH-1D and H and UH-19 helicopters (altogether more than 80 planes and about 35 helicopters.)

Four supply centers have been established to supply air force units. Each of them has its own designation; stores certain types of munitions, combat equipment, and other materiel; and provides them to units and organizations. These centers have repair facilities and assembly shops.

Turkish air defense is an essential component of the combined NATO armed forces in Europe (the zone of responsibility of 6 ATAF). For their more effective employment, the entire territory of the country is divided into two air defense sectors (Western and Eastern). Command of the air defense is exercised by the air force commander through his staff and the air defense leadership.

Air coverage of the majority of the country is provided by interceptor aircraft and anti-air artillery. The RAPIER batteries are mainly responsible for defense of airfields, and NIKE HERCULES batteries for the Black Sea entrance region. Notification about air targets and direction of a response is carried out on the basis of information from radar stations in the NAGE NATO automated air defense control system.

In accordance with bloc leadership plans the first base on Turkish territory, for launching radar planes and controlling the E-3A AWACS, has been opened at Konya.

According to the Western press, during the last five years, Turkey has received from the U.S. and other NATO countries about 90 F-4E multimission tactical fighters, and more than 100 F-104Gs. Negotiations are ongoing for the purchase of F-4s from the U.S. and Egypt, TORNADOS from Great Britain and the FRG, and military transport aircraft from Spain, Italy, and Canada. Great hopes are placed on the short-range RAPIER missile (Great Britain), of which more than 20 are planned to be bought. Plans call for equipping aviation units with guided weapons, especially in the air-air (SWINGFIRE, SPARROW, FALCON, and SHAFRIR) and the air-ground (AS-12, BULLDOG, and MAVERICK) classes.

Measures are being taken to achieve rapid availability of the aviation factory at Myuted, at which, together with the United States, the F-16 tactical fighter will be produced.

The navy (49,000 personnel) is headed by a commander who carries out administrative and operational control of the navy through his headquarters (Ankara). It comprises the fleet, the northern and southern naval zones, and training. In exceptional times the navy partially or wholly controls the

coast guard, while in peacetime it is subordinate to the ministry of internal affairs.

As reported in the foreign press, in wartime the Turkish Navy accomplishes these basic missions: blockade the Black Sea straits, combat submarines and surface vessels in the Black Sea and the northeastern part of the Mediterranean, support the army, influence sea lines of communication and disrupt enemy communications, and conduct reconnaissance in support of the national armed forces and NATO.

The fleet is the principal operational element of the navy, including practically all of the ships. Organizationally, it consists of four flotillas: combatants, submarines, minesweepers, and missile and torpedo boats. Flotillas, in turn, are organized into divisions. Naval air is also subordinate to the fleet.

JANES shows that the Turkish Navy has about 200 ships and boats, of which 16 are submarines, 2 are guided missile minelayers, 12 are minelayers, 4 frigates, 41 landing vessels, and 40 minesweepers, 14 missile, 11 torpedo, 30 patrol craft, and more than 30 landing boats, as well as more than 100 support ships and boats. Additionally, the coast guard has about 30 patrol craft. Ships in the main classes are principally former U.S. naval vessels provided at various times as military aid.

Five naval bases have been established for the fleet (Geldjuk, Ereğlis, Istanbul, Izmir, and Iskenderun) and eight base points. In peacetime the fleet's main base is the Geldjuk Naval Base, and in wartime the others are included.

Naval aviation comprises 15 TRACKER patrol planes (S-2A and S-2E) and 6 ASW helicopters (3 AB-204 and 3 AS-212), which are organized respectively into two squadrons. They have the following missions: combat enemy submarines, reconnaissance, and laying mine fields.

The Naval command is organized territorially. It is responsible for actions on the coast, in the vicinity of naval bases, and for the supply and support of vessels operating in its territory. Each zone comprises a headquarters, local commands (Black Sea and Bosphorous and Dardanelles in the north, and Aegean and Mediterranean in the south), divisions of patrol craft, landing flotillas, and an insignificant number of support ships. In wartime these commands have operational and support responsibility for the naval units subordinate to them.

The training command includes higher and intermediate naval training institutions, training regiments, schools, courses and training centers for surface and subsurface elements of the fleet. It has the missions of training enlisted, non-commissioned, and commissioned officers for the navy.

The main naval base at Geldjuk is the fleet's principal base. The majority of the ships of the navy are based there. Reserve ships, repair facilities and repair shops, supply centers, dry docks, and stores of ammunition, mines and torpedoes are subordinate to it in an operational relationship.

Responsibility for organizing anti-invasion defense of the shore, defense of the main naval base, basing points and principal national ports is assigned to the newly created shore defense command. It has four zonal commands: the regions of the Black, Aegean and Mediterranean Seas and the Black Sea straits.

Improvement of the Turkish Navy is principally through qualitative modernization and quantitative increase of the ship component through deliveries from abroad and ship building at national drydocks. The main attention is given to building new submarines, missile ships, and boats. As reported in the foreign press, Project 209 submarines are being built at the Geldjuk drydocks with the cooperation of the FRG. At FRG and Turkish drydocks, construction of missile frigates and DOGAN-Class missile boats goes on. Mass production of small landing craft and patrol craft (type SAR33) for coastal defense is planned.

They have declared their intention to raise the combat potential of naval aviation. AB-212ASW ASW helicopters continue to be delivered from Italy. Talks are being conducted with the United States about replacing the old TRACKER aircraft with more modern ones.

In recent years the armed forces have paid more attention to development of diversionary forces designed to conduct reconnaissance/diversionary operations on land and in enemy waters, as well as for securing underwater approaches to the naval bases and the straits. Several SEAL organizations have been formed in the Turkish armed forces.

On the whole, in foreign military specialists' opinion, the Turkish armed forces constitute a formidable part of the NATO force, strengthened and equipped with new types of arms and to which the North Atlantic command pays continuous attention.

1. The Aegean (or 4th) Field Army, according to Turkish political-military leadership claims, was created to repulse possible Greek aggression.

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CENTRAL U. S. ARMY SUPPORT ORGANIZATIONS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 19-23

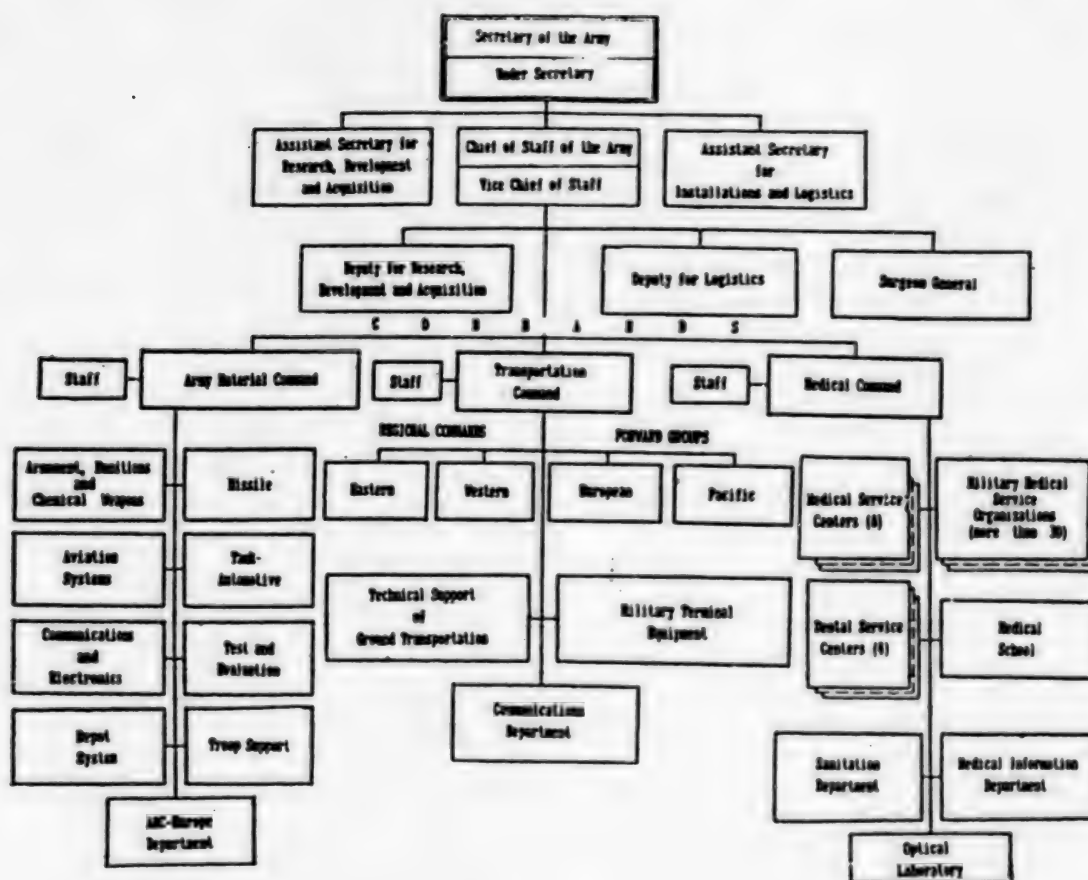
[Article by Col S. Semenov; "Central U.S. Army Support Organizations"]

[Text] In molding and training the Army for protracted combat, the American leadership pays great attention to matters of combat service support. In the opinion of the national military leadership, timely and complete support of forces with all necessities will be, in contemporary conditions, one of the most important factors for maintaining continuous combat readiness in peacetime and maintaining high fighting capability throughout combat activities. As reported in the American military press, a centralized system for supply of weapons, military equipment, ammunition, and other material items, as well as for the planning of technical, medical and other forms of supply and support has been developed and is constantly improved. The respective support organizations of the Army, Air Force and Navy are responsible for the uninterrupted functioning of this system.

Army support organizations, depending on their designation, roles, and relationship to accomplishing support missions, are divided into central support agencies, operational support, and troop support. The first refers to the Army Materiel Command (AMC), the Traffic Management Command (TMC), the Medical Command (MEDCOM), and national control and computing points which collect and manage data on demands and requisitions, and control the distribution of materiel to consumers. The second includes units and organizations which have missions of organizing and executing support for U.S. Army groups in a theater: Support Command (SUPCOM), Ordnance Brigade, Transport Command (TRANSCOM), Medical Support Command (MEDSCOM), and Materiel Management Center (MMC). The third applies to organic organizations for supporting troop formations which are joined together in the corps: Corps Support Command (COSCOM), and the division: Division Support Command (DISCOM). This article, prepared from data in the American military press, will examine the organization and mission of the most important links in the support system--the central support organizations (see schematic).

The ARMY MATERIEL COMMAND (AMC), was created in 1962, and is responsible for direct support of the Army with all types of materiel except for fuel, rations and clothing, the supply of which is handled by the Defense Logistics Agency

The Command headquarters controls the activities of all subordinate organizations, central Army depots and bases, procurement offices, control and supply installations, research and development institutions, and support specialist training centers. It consists of departments which accomplish the following missions: control of the centralized system of supply and Army production facilities (arsenals); assisting operational and troop support organizations, especially in difficult situations; determining the priority and schedule for the procurement of material items for the Army, and accountability for them; control of the quality of training for supply specialists in schools.



The Armament, Munition and Chemical Command (AMCCOM) conducts RDT&E for developing and improving all of the named types of weapons for the army, except missiles. Its most important work is in the field of artillery and rifled weapons, weapons systems for army aviation, and chemical weapons. It also controls five major army arsenals and more than 20 industrial enterprises which manufacture ammunition, as well as the development and production of binary chemical rounds.

Missile Command (MICOM) conducts basic and applied research, development and testing, and organizes production of tactical and operational missiles for the army. Additionally, it has the mission of providing technical support and repair for missile systems and utilization for obsolete or deadlined missiles and equipment. Up to 85 per cent of the materiel managed by this command is produced by private firms which are specialized enterprises for accomplishing massive production of missile components.

The Aviation Research and Development Command (AVRADCOM) together with research institutes and design bureaus of private aviation companies engages in development, organization of production, and technical support and repair of army helicopters and airplanes. It also conducts RDT&E to improve existing types of helicopters and planes. Besides this, its specialists develop specialized stocks of spare parts and instruments, special instructions, and other technical documentation for the use of adopted models of army helicopters and planes.

Tank-Automotive Command (TACOM) develops and brings to mass production new models of armored vehicles. Other aspects of its responsibilities include organization of production and procurement of the optimal quantity of spare parts and supplies for both depot- and troop-level maintenance of wheeled and tracked vehicles. Also, it assists the armed forces of foreign countries which use U.S. military equipment.

The Communications Electronics Command (CECOM) conducts RDT&E of new and improved communications systems and devices. Under its control are testing of apparatus and equipment, their technical support and repair, preparation of documentation for adoption of new equipment, and other missions for the army.

Test and Evaluation Command (TECOM) has many missions in the conduct of testing of developing models of weapons and new equipment. A peculiarity of the role of this command is its relative independence within AMC, which assures its objectivity concerning equipment developed and submitted for testing by other commands and private companies. Among its responsibilities is to conduct testing under conditions as close as possible to actual combat. Its subordinate elements conduct two basic types of testing. The first includes factory or troop testing of new items in the command program, as well as testing the first production models for exacerbation of problems which were revealed in the factory or troop testing. The second is the testing of separate models according to a program, made in the Command's facilities or private firms, other agencies of the Department of the Army or Department of Defense to evaluate several parameters of the planned production.

Depot System Command (DESCOM) organizes the stocking of weapons and military equipment, articles of supply, and other material items in army warehouses, as well as their distribution to units according to department of the army orders. There are 12 major depots subordinate to it.

Troop Support and Materiel Readiness Command (TSARCOM) conducts development of various items of support equipment necessary in the daily lives and activities of troops, and distributes it to consumers.

U.S. Army Materiel Command Europe has the responsibility for organizing the support of U.S. Army forces in Europe. It was created in 1983, at the time of reequipping of American corps with new weapons and military equipment. Its principal mission is the distribution to the troops of modern armaments, organizing their proper use and repair. Also, special departments organize the training of personnel in service units in using and repairing the combat equipment.

In foreign military specialists' opinion, AMC can execute complex mission in supporting groups of army forces, formations and units.

The TRANSPORTATION COMMAND plans and executes the transportation of military and other cargo for the department of the army, and for servicemen and their families. It has the mission of organizing ground transportation in the continental U.S., development and improvement of plans for use of transportation assets of the department of defense, the government and private sectors in case of the announcement of mobilization, for maintaining and servicing terminals, their equipment and transportation equipment parks at ports and terminals in theaters with coastlines, and especially in Europe.

The Command includes a headquarters, two regional commands in CONUS (Eastern and Western), two forward groups (in the European zone and in the Pacific zone), a directorate of ground transportation, a group for terminal equipment, a department for the joint movement of troops for the department of defense.

The headquarters is responsible for receiving, calculating, processing, and allocating orders and requests for transportation of troops and military cargo, and develops measures for supporting mobilization readiness of troops and equipment for providing support for strategic movement in cases where an extraordinary situation arises in the country.

The Eastern Regional Command organizes transportation in the 34 eastern states in the continental United States along with the Azores and the Panama Canal Zone.

The Western Regional Command performs similar duties in the 14 western states of CONUS. Its "zone of responsibility" also includes Alaska and Japan, including Okinawa, which has American military bases.

Both commands have direct responsibility for movement of troops and cargo in their "zones of responsibility." Their subunits organize movement by road and

by railroad in CONUS, as well as internal water ways and coastal waters for the department of defense using both their own and commercial means.

As reported in the foreign military press, Transportation Command uses three military transshipment bases in CONUS, ten specially equipped ports and five naval bases on the American coast. It also controls 27 cargo terminals in Europe, 4 in Japan (of which three are on Okinawa) and a terminal in the Azores. In conducting a movement, the command coordinates closely with the Military Airlift and Sealift Commands, as well as other services to ensure agreement in plans for delivering troops and cargo in case of mobilization and the conduct of strategic movement and operational deployment of forces.

In American specialists' opinion, this command occupies one of the most important places in the mobilization and operational readiness system for the army and the entire armed forces. It also has responsibility for strategic deployment of the forward forces and for delivery to the troops of all necessities for sustained combat.

The MEDICAL SUPPORT COMMAND is responsible for organizing army medical support, training of medical personnel of various specialties, and conducting medical research. It includes a headquarters, 8 medical centers, more than 30 medical service facilities, the medical academy, a department of sanitation and information, and an optical laboratory. Its principal subunits are the medical centers and medical service facilities.

The command headquarters provides overall leadership over the activities of subordinate organizations, services, and special schools, and develops new and better procedures and documents, and determines the methods of organizing medical support of the forces.

Military medical centers are large, general hospitals, in which sick or wounded are treated in order to be returned to duty. The centers conduct medical research and retraining of medical personnel to raise their qualifications.

Medical Service Facilities have responsibility for medical support of units. Each facility, as a rule, includes a general hospital, several clinics and medical departments. The hospital and clinics treat servicemen in the territory, that is in the area assigned to the facility. Sick and wounded who are difficult to diagnose and require long hospitalization can be transferred to the appropriate medical center. The rest are treated and returned to their units. The Medical Service Command organizes medical support at all levels to ensure that uninterrupted treatment continues until the sick or wounded are returned to duty or discharged from active duty. Patients are only evacuated as far as their condition demands.

Plans call for the use of civilian hospitals in extreme circumstances for military patients under the terms of agreements which have been arranged between them and federal departments. According to the foreign press, the Pentagon plans to use not less than 50,000 beds in case of war.

The Medical Support Command plays an important role in the entire system of general support. Under its control are the principal means of providing medical support in peacetime, as well as the main mechanism for mobilizing combined civilian and military hospitals in wartime. It is believed that successful accomplishment of their mission contributes to the combat readiness of the army by returning to ranks the maximum number of personnel who have become sick or been wounded.

On the whole, in the U. S. Army's opinion, the existing structure of central support makes it possible to even more effectively organize the material-technical and medical support of units in various types of war.

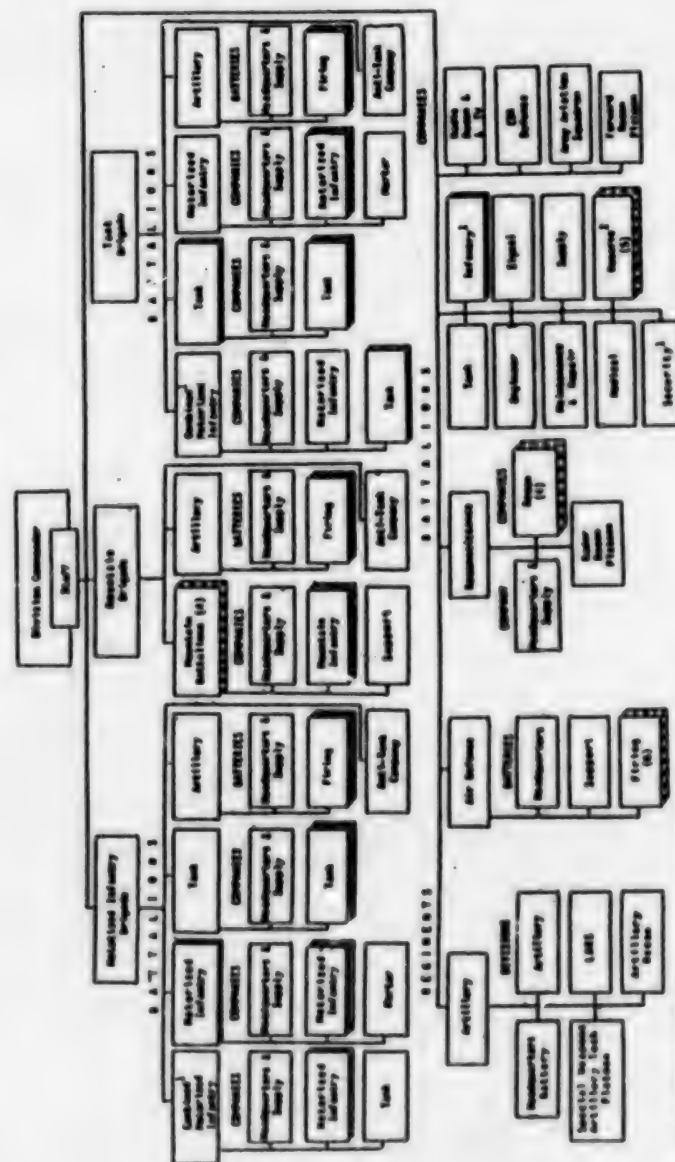
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Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 33-34

FRE MOUNTAIN INFANTRY DIVISION



1. In question, enter only
2. For multiple selections, check boxes. In question, enter only.

PERSONNEL, AIRCRAFT AND TRANSPORT RESOURCES OF A WEST GERMAN MOUNTAIN INFANTRY DIVISION

PERSONNEL AND AIRCRAFT		Personnel Strength													
Headquarters & Headquarters Company		380	3,500	5,200	3,200	2,200	800	520	480	660	780	600	1,000	1,300	1,100
Motorized Infantry Brigade		54	72	25	46	5	31	54	2	5	6	10	30	40	15
Mountain Brigade		0	0	0	0	0	0	10	0	0	0	0	0	0	0
Tank Brigade		110	110	110	110	110	110	110	110	110	110	110	110	110	110
Artillery Regiment		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Air Defense Artillery Regiment		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reconnaissance Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tank Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Two Infantry Battalions (each)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engineer Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Signal Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maintenance & Repair Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Supply Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medical Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Security Battalion		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Subunits		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		23,590	110	142	118	160	16	34	6	35	18	18	54	16	182

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DIRECT AIR SUPPORT AIRCRAFT

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[Article by Col B. Ivanov; "Direct Air Support Aircraft"]

[Text] The military leadership of the aggressive NATO bloc considers that one of the main missions assigned the air forces is direct air support of the troops. It is defined in the foreign press as the ground-attack actions of aircraft against enemy targets located on the battlefield or in the immediate proximity to the line of contact of the opposing sides. Although the rendering of direct air support is entrusted to almost all tactical aviation aircraft, nevertheless, foreign experts consider that it is the most effective when carried out by aircraft specially developed for this mission. Foreign specialists include in these ground-attack aircraft, light ground-attack aircraft developed on the basis of combat-training aircraft, special purpose aircraft for conducting so-called counter insurgent operations from the air, and also armed military transport aircraft.

Ground-attack aircraft. Primarily American developed ground- attack aircraft comprise the armament of capitalistic countries' air forces. They are entrusted with executing the following missions; supporting offensive and defensive troops, delaying the movement of enemy forces during the necessary withdrawal of their own troops, conducting combat on the battlefield primarily against the enemy's armoured equipment.

The A-4 SKYHAWK aircraft was produced serially from 1954 to 1979, in 17 various modifications. Of 2,960 A-4 aircraft, 2,405 were manufactured as a single-seat variant, and 555 as a two-seat variant. This ground-attack aircraft was widely used by the American aggressors in Southeast Asia and by Israel in the Near East. Currently, various modifications of the A-4 SKYHAWK aircraft are included in the armament of the U.S., Argentina, Australia, Indonesia, Israel, Kuwait, Malaysia, New Zealand and Singapore.

According to American specialists' evaluations, the most improved of the A-4 modifications is the A-4M. Its J52-P-408A engine with 5,080 kg of thrust provides an adequately high climb rate and maneuverability, and provides the capability to take-off from small dimension airfields. With a take-off weight of 10,430 kg and a payload of 1,800 kg, the aircraft's maximum ground speed is

1,030 kmph and its operational combat radius is 535 km. In the aircraft's design, attention was paid to increasing its survivability; in particular, the windshield is non-penetratable to machine gun fire, and the pilot is protected, in front and behind, by armored plates. A radar, automatic flight control system, inertial navigation system, radiocompass, reconnaissance receiver, and radio altimeter comprise the onboard electronic equipment. The aircraft can carry the AN/ALE-20 chaff dispensing unit.

The single-seat A-4N SKYHAWK ground-attack aircraft of the Israeli Air Force has a take-off weight of 12,440 kg, a maximum speed of 1,030 km/hr, a service ceiling of 14,500 m, and a ferry range of 3,300 km. Its armament includes two built-in 30-mm DEFA cannons (150 round cartridge basic load), guided- and unguided-missiles, and bombs accommodated on five external suspension stations. The maximum payload weight is 4,150 kg. Judging by foreign press reports, the firm, Israeli Aircraft Industries, is presently implementing a program to improve the characteristics of the A-4 ground-attack aircraft. The program is intended for increasing the time between repair, replacing the entire electrical system, increasing the effectiveness of the brakes, increasing the number of weapons suspension stations (to two), lengthening the exhaust pipe in order to reduce the heat emissions and increase the aircraft's operational secrecy, and equipping it with a more improved sighting and navigation system.

The A-7 CORSAIR-2 aircraft was produced serially from 1966 to 1983. In all more than 1,600 aircraft were produced. They exist in the inventory of the U.S., Greek, and Portuguese Air Forces. The aircraft was designed with a normal aerodynamic configuration with a high-set swept wing and single-fin tail unit. It is equipped with the TF41-A-1 double-flow turbojet engine with a maximum thrust of 6,470 kg. To insure the aircraft's survivability, the cockpit, engine compartment and hydraulic stabilizer system are protected by boron carbide-based ceramic armor. The general weight of the armor shield is 210 kg. A three-fold redundant control system is used on it to maintain the aircraft's controllability if the structure is damaged. One built-in 20-mm six-barrel VULCAN cannon (500 round cartridge) is installed on it. Various variants of guided- and unguided-missiles, and bombs (a maximum payload of 6,800 kg) can be accommodated on six under-wing and two under-fuselage pylons.

According to foreign press reports, the onboard electronic equipment enables quite precise bombing from medium altitudes during a horizontal flight with lead-aim sighting, using a radar, and firing from a cannon. The most accurate bombing occurs with a dive (a circular error probable of approximately 10 m). The aircraft's sighting and navigation equipment includes a forward-looking radar, a doppler radar, an inertial navigation system, and a moving terrain map display. The main characteristics of the A-7D ground-attack aircraft are; maximum take-off weight, 19,000 kg; maximum ground speed, 1,115 km/hr; service ceiling, 13,100 m, and an operational radius of 370-900 km.

The A-10 THUNDERBOLT-2 aircraft was developed especially to render direct air support to the the ground troops. During its development along with a high manufacture adaptability, low cost, ease of repair and acceptable performance characteristics, specialists of the developing firm, Fairchild, tried to provide increased survivability through the protection of the fuel tanks, a

redundant control system, and armor coating the cockpit, engines and other important structural features.

It is reported in particular, that the semimonocoque type fuselage, having four strong continuous section spars and a large number of single traverse frames, cannot be destroyed even with damage to the two diametrically positioned spars and two sheathing panels adjacent to them. The low-set, three-spar wing consists of three sections (the fuel tanks are located in the central section). The tail has two fins. The air tight cockpit is included in the aircraft's power system and embodies the most protected design, being made from modern construction titanium armor (the thickness of its individual panels varies from 12.7 to 38 mm). The cockpit has an inside nylon flak shield, reducing the danger of the pilot being hit by attachment components and secondary fragments of its armor. A transparent armored unit is installed in the forward section of the canopy which can withstand the hit of a 12.7-mm armor-piercing shell or birds weighing up to 1.8 kg. The side panels of the cabin's windshield is also hit-proof and does not give when hit by secondary fragments of the destruction elements.

The aircraft's power plant consists of two TF34-GE-100 double-flow turbojet engines with a maximum thrust of 4,100 kg, located in separate partially-armored nacelles along both sides of the fuselage tail section behind the wing. Two protected wing and two fuselage tanks comprise the fuel system. The maximum fuel supply in them is approximately 5,000 kg. All the tanks are internally coated with cellular plastic so that an explosion of the air-fuel mixture is prevented if they are damaged. The armament includes a built-in 30-mm seven barrel GAU-8/A cannon (the basic load is a 1,174 round cartridge), the MAVERICK guided-missile and various purpose and types of bombs, including guided bombs accommodated on 11 external suspension stations. The maximum payload weight is 7,250 kg. The sighting equipment includes: an optical sight, an information image display on the windshield, and the PAVE PENNY laser detection and tracking system. In the future, it is planned to use the LATIRN all-weather sighting and navigation system on it.

American A-10 ground-attack aircraft, based in Western Europe, are intended primarily for fighting the enemy's armored tank equipment. Judging by foreign press reports, four MAVERICK guided-missiles, a complete basic load for the cannon, the PAVE PENNY suspension pod, the AN/ALQ-110 radar suppression system, and a maximum fuel supply in the internal tanks comprise the aircraft's normal payload. It is considered that such a load provides the best combination of speed, maneuverability and effectiveness, good take-off and landing performance and sufficient operational time over the battlefield. To hit ground targets, it is recommended that the pilots use the cannon because it is a weapon with a high rate of fire and easy to use. They think that its armor-piercing incendiary charge can put a tank out of commission with a hit on it from a range of approximately 1,800 m. The MAVERICK missiles are usually employed from a range of not less than 3,000 m, but against well marked and large targets, they can be employed up to 19 km. The aircraft's maximum take-off weight is 22,700 kg, the maximum flight speed is 720 km/hr (at an altitude of 3,000 m), the service ceiling is 10,600 m, the operational radius is 460-1,000 km. The A-10 THUNDERBOLT-2 ground-attack aircraft comprises the

inventory of only the U.S. Air Force, and the delivery into online units of all 713 ordered aircraft was completed in 1984.

LIGHT GROUND-ATTACK AIRCRAFT. In recent years, there has been interest noted abroad in combat-training aircraft which would also be able to execute direct air support missions. It is considered, that to successfully carry out this mission, these aircraft must possess sufficient range and flight time, survivability (due to the use of enemy air defense systems), and the capability to operate from forward airfields or unequipped surfaces located near the battlefield region, and also have various armament.

Information is presented below on the most widely deployed types of light ground-attack aircraft developed on the basis of combat-training aircraft.

The A-37 aircraft was produced by Cessna, in two modifications, the A-37A and the A-37B. The Pentagon used them widely in the aggressive combat operations in Vietnam for direct air support to the ground troops, helicopter accompaniment during assault operations, air combat patrols, and the isolation of the battlefield region at night.

Compared to the A-37A, the A-37B has more stable structural features, an armored cockpit, increased maneuverability and controllability at high flight speeds with a maximum payload, and more powerful armament. The aircraft was produced serially from 1969-1975 (in all, approximately 600 aircraft were produced). Its maximum take-off weight is 6,350 kg; clean weight, 2,650 kg; maximum ground speed, 770 km/hr and 810 km/hr at 4,800 m altitude; service ceiling, 12,700 m, and the operational radius with a payload of 1,850 kg is out to 740 km. The power plant consists of two J85-GE-17A turbojet engines with a maximum thrust of 1,290 kg. The fuel is accommodated in two wing tanks (the capacity of each is 428 liters), two non-ejectable tanks on the end panels (each with 360 liters), and one on the fuselage tank (344 liters). The general fuel supply is 1,920 liters. The aircraft is equipped with an in-flight refueling system. The armament includes one built-in 7.62-mm six-barrel MINIGUN machine gun with a 1,500 round cartridge basic load, bombs and bomb dispensers for various caliber bombs up to 750 pounds, and launch racks for 70-mm rockets, accommodated on eight underwing stations. The A-37B light-ground attack aircraft comprises the air force inventory of the U.S., South Korea, Thailand, Guatemala, Honduras, Columbia, Paraguay, Peru, Chile, and Salvador.

The HAWK aircraft was developed by the English firm Hawker Sidley and has been produced since 1974. According to foreign military specialists' opinions, the HAWK aircraft can be employed successfully for direct air support to the ground troops due to its flight performance characteristics and combat capabilities. The aircraft is designed with a conventional aerodynamic configuration with a low-set small swept wing. The power plant consists of one ADUR Mk-151 double-flow turbojet engine with a maximum thrust of 2,400 kg. The fuel supply (1,700) is accommodated in a fuselage and integral central wing tanks. It is possible to suspend two additional fuel tanks with a capacity of 460 liters each. The radioelectronic equipment includes an HF and VHF/UHF radio, the TACAN radio navigation system, a course and glide path landing and radar identification system, and also sighting and navigation equipment (the

later is intended for the execution of navigation missions and the visual detection and attack of ground targets using bombs, rockets and a cannon).

The armament of the light ground attack aircraft is accommodated on five external suspension stations: a cannon pod with a 30-mm ADEN cannon and a 100 round cartridge basic load is usually suspended on an underfuselage station. Bombs and rocket launcher racks are suspended on the underwing stations. The main data on the aircraft is: the maximum take-off weight is 7,750 kg, the maximum payload weight is 2,400 kg, the maximum speed is 930 km/hr (at an altitude of 11,000 m), the service ceiling is 14,600 m, and the operational radius is approximately 560 km. The English press, in widely advertising the merits of the HAWK aircraft, reports that it maintains high flight characteristics in various climatic conditions, is respectively easy to service, and with a service life of 6,000 flying hours, can be operated for a long time. HAWK aircraft are found in the air force inventories of Britain, the Netherlands, Kenya and Zimbabwe.

Presently, judging by Western press reports, a single-seat variant of the HAWK aircraft (which received the designation HAWK-200) is being developed, representing an inexpensive light ground attack aircraft which will be able to operate during daytime and nighttime in any weather. It is planned to install two built-in 25-mm ADEN cannons, various electronic equipment, including a radar, laser rangefinder, forward looking IR system, and multifunction color display on it. The newly modified ADUR engine with the maximum thrust increased by 10-14 per cent and a lower specific fuel consumption permits the aircraft to execute combat patrols lasting 4 hours at ranges of 180 km from the take-off airfield. With two 430-liter suspension tanks, the ferry distance is approximately 4,000 km. The HAWK 200's payload was increased to 3,000 kg and will include bombs, rockets and guided-missiles.

The STRIKEMASTER aircraft was produced from 1968-1978 by the English firm, British Aerospace. It comprises the air force inventories of Ecuador, Kenya, New Zealand, Oman, Saudi Arabia and Singapore. The aircraft's maximum take-off weight is 5,200 kg; maximum speed (at 6,000 m altitude), 760 km/hr; service ceiling, 12,200 m; and the operational radius is up to 400 km. One turbojet engine, with a thrust of 1,550 kg, is installed on it. The armament includes two 7.62-mm machine guns, up to 500-lb caliber bombs, launch racks for 68 and 80-mm caliber rockets. The maximum payload is 1,360 kg.

The ALPHA JET aircraft was developed jointly by the West German firm, Dornier, and the French firm, Dassault-Breguet, and has been serially produced since 1977. It is included in the air force inventories of France, the FRG, Belgium, Egypt, Morocco, Norway, Qatar, and Togo. It embodies an all metal monoplane with a high-set swept wing and single tail fin fuselage. The power plant includes two double-flow turbojet engines with a thrust of 1,50 kg. The fuel supply (1,000 liters) is accommodated in two wing, one central wing and three fuselage tanks. Two additional 310-liter tanks can also be suspended under the wing. The armament composition depends on the mission to be executed. The payload is accommodated on one underfuselage and four underwing stations. The 27-mm MISTRAL cannon or the 30-mm DEFA pod-contained cannon with a 150 round ammunition cartridge can be suspended on the under-fuselage station. Bombs,

rocket launch racks, and pods with reconnaissance and EW equipment can be carried under the wing station. The maximum payload weight is 2,500 kg.

The main data on the aircraft is: maximum take-off weight, 8,000 kg, maximum ground speed, up to 1,000 km/hr; service ceiling, 14,600 m; operational radius at low altitudes, 430-550 km, and the ferry range is 4,000 km. According to West German specialists' opinions, the ALPHA JET ground-attack aircraft can operate from short dirt surface airfields (with a normal take-off weight of 5,000 kg, the take-off and landing runs are 430 and 500 m, respectively), which permits aviation subunits to be located at a prefrontal field near the supported troops and to frequently change the basing location independent of the presence of a hardsurface runway. The long flight time provides the capability to employ these aircraft from air alert in zones extremely close to the battlefield. Although the ALPHA JET can fly during the day and at night and in simple and complex weather conditions, it can deliver strikes only when there is good visual visibility. The onboard navigation equipment permits the aircraft to approach the target area with the accuracy adequate to attack its target. It is also considered, that the aircraft can successfully destroy various targets on the battlefield and in the tactical depths of the enemy defense, including small mobile targets (tanks, armoured transport vehicles and other vehicles).

Currently, a new variant of the ALPHA JET aircraft, the ALPHA JET NGEA or the ALPHA JET-2 is being developed and undergoing flight trials in France. It is distinguished by more powerful engines and a modern sighting and navigation equipment complex. The aircraft, as French experts think, will be able to execute combat patrols, attack ground targets from low altitudes, and destroy enemy helicopters. With a fuel supply (2,000 liters) in internal tanks and 900 liters in additional suspension tanks, the ALPHA JET-2 will have a flight range of 1,200 km with a 2,500-kg bomb load. The air patrol time for this is 3 hours and 45 minutes.

The MB-326 aircraft has been serially produced by the Italian firm, Aeromacchi, since 1959, in various modifications, and is built under license in Australia, Brazil and the Republic of South Africa. The aircraft is included in the air force inventories of Italy, Argentina, Australia, Brazil, the Republic of South Africa, Ghana, Tunisia, and Zaire, and Zambia. One of the later modifications is the MB-326K single-seat light ground-attack aircraft (in the Republic of South African Air Force it has the designation Impala-20). It is equipped with a turbojet engine with a maximum thrust of 1,800 kg. The fuel (1,660 liters) is accommodated in three fuselage tanks and two tanks, permanently attached to the end part of the wing panels. Two additional 340-liter tanks can be suspended under the wing. The radio communications, navigation and sighting, and other onboard equipment varies depending on the aircraft's purpose. The armament includes two built-in 30-mm DEFA cannons (the basic load is a 125 round cartridge), unguided-missiles and bombs. The maximum payload weight is 1,800 kg. The aircraft's main characteristics are; the maximum take-off weight, 5,200 kg; the maximum speed (at 6,000 m altitude), 780 km/hr; service ceiling, approximately 12,000 m, and the operational radius is 130-650 km.

The SF-260 aircraft, developed by the Italian firm, SIAI-Marchetti, has been manufactured in various modifications since 1969. For example, the SF-260W can be used for delivering strikes from low altitudes, and conducting reconnaissance and communications. The payload weighing up to 300 kg can be accommodated on two external suspension stations, including machine gun installations, rocket launcher racks, and small-caliber fragmentation and incendiary bombs. The maximum take-off weight of this aircraft is 1,360 km. The maximum ground speed is 330 km/hr, the service ceiling is 4,600 m, and the operational radius is 550 km. It is part of the air force inventories of Ireland, the Phillipines, Singapore, Tunisia, Zaire, and Zimbabwe.

The C-101 Aviojet aircraft was developed by the Spanish firm, Casa, and has been serially produced since 1978. According to foreign military expert's opinions, the comparatively high flight characteristics, the presence of modern radioelectronic equipment, the low rate of technical servicing, and the various variants of suspended armament provide the potential to use it for direct air support in the 1990s. The power plant consists of one double-flow turbojet engine with a maximum thrust of 2,130 kg and is distinguished by a low specific fuel consumption. The aircraft has a maximum take-off weight of 6,300 kg, a maximum speed of 800 km/hr at an altitude of 6,000 m, a service ceiling of 12,800 m, and an operational radius with an attack on targets at low altitudes of more than 460 km.

The payload with a maximum weight of 2,250 kg can be accommodated on seven external suspension stations (one under-fuselage and six underwing stations). The payload includes a 30-mm DEFA cannon suspension pod, the MAVERICK guided missile, bombs, and various combinations of unguided rockets. The aircraft comprises the armament of the Spanish, Chilean and Honduran Air Forces.

COMBAT AIRCRAFT FOR ANTIPARTISAN OPERATIONS. Work was carried out in the U.S., in the middle of the 1960s, to develop a light armed aircraft, specially intended for operations against partisans in wars to suppress national liberation movements. The OV-10 Bronco, widely used by the Pentagon in the aggressive war stirred up by American imperialism in Southeast Asia, is such an aircraft. In the middle of the 1970s, a similar plane was developed in Argentina and was designated the Pucara.

The OV-10 Bronco aircraft is a dual-girder cantilever monoplane with a high-set straight wing. The powerplant consists of two turboprop engines each with a power of 715 h.p. The cockpit has an armor shield which weighs 198 kg. The main electro-hydraulic control system is duplicated by a mechanical system. The armament includes four 7.62-mm machine-guns each with a 500-round cartridge basic load. The payload, generally weighing 1,600 kg, can be accommodated on four outboard underwing stations and one station under the fuselage. The payload includes rockets, bombs and mines. The aircraft's maximum take-off weight radius with the maximum payload is 370 km, and the service ceiling is 8,200 m. The Bronco aircraft is found in the air force inventories of the U.S., the FRG, Thailand, South Korea, Indonesia, Morocco, Venezuela, and the Philippines.

The IA-58 PUCARA aircraft has been produced since 1973, by the Argentinian firm, Fabrika militar de aviones. It was used in the English and Argentinian

conflict over the Falkland (Malvinas) Islands. The aircraft embodies a two-seat monoplane with a low-set straight wing. The canopy glass is impenetrable to machine gun fire and the cockpit floor is protected by armor. The powerplant consists of two 1,020 hp turboprop engines. The fuel supply (1,260 liters) is accommodated in a fuselage tank and two wing tanks. The aircraft has a maximum take-off weight of 6,800 kg, a maximum flight speed (at 3,000 m altitude) of 500 km/hr, a service ceiling of 10,000 m and an operational combat radius of 450-750 km. The armament includes two 20-mm cannons (each with a 270 round cartridge basic load), four 7.62 machine guns (each with 900 rounds), rockets, bombs, torpedos, and air-to-ground guided missiles, accommodated on two underwing and one underfuselage suspension station. The maximum payload weight on the payload on external suspensions is 1620 kg. A new modification of the aircraft is being developed by the firm, which is distinguished by more modern radioelectronic equipment and armament. Presently the air forces of Argentina and Uruguay are equipped with PUCARA aircraft.

ARMED MILITARY-TRANSPORT AIRCRAFT. To execute antipartisan (anti-insurgent) operations, to protect reconnaissance-diversionary groups and other similar operations from the air, the pentagon uses specially equipped and armed military-transport aircraft, more frequently designated "gunship." The first of these was the AC-47D, equipped with two 1,200 horse power piston engines. The aircraft's maximum take-off weight is 11,800 kg; maximum speed, 370 km/hr; flight range, 2,400 km and the service ceiling, 6,340 m. The armament includes three 7.62-mm caliber machine guns, which are fired through an open door or window. The employment results of these aircraft in the first independent operations in South Vietnam against moving vehicle columns at night served as the basis for reequipping the more powerful and faster C-119 aircraft with armament, resulting in the AC-119G and K. The AC-119G had two 3,500 hp piston engines and could attain a maximum speed of 430 km/hr. Its armament included four 7.62-mm six-barrel MINIGUN machine guns.

A combined powerplant and gun armament were used for the first time on the AC-119K aircraft. Besides piston engines, two 1,290-kg thrust turbojet engines were installed on it, which increased the aircraft's speed and maneuverability. Two 20-mm cannons were also carried on it. After the C-119, the C-130 was reequipped with armament. It was reported, specifically, that in 1967-1968, 20 aircraft underwent modernization. Two 20-mm VULCAN cannons and two 7.62-mm machine-guns were installed on it. Later the VULCAN was replaced by 40-mm cannons and the basic load simultaneously increased on AC-130A and AC-130H aircraft. Anti-fire armor found extensive use in their design. Computers were adopted for centralized fire control.

According to foreign press reports, AC-130H aircraft were used by American military men during the capture of Grenada (seven aircraft participated in the combat operations). Equipped with a refueling system, they were able to remain airborne for more than 15 hours, including approximately 8 hours in the target area. The crew was increased to 18-20 men. All the gun armament is hydraulically powered and controlled by a computer.

Currently, armed military-transport aircraft continue to be improved, and their combat employment is being worked out during various exercises. The main purpose of the aircraft remain as before: to carry out antipartisan

operations, to provide air cover for special purpose ground forces and fire support to forward assault units. However, as Western specialists note, such aircraft, due to their high vulnerability can only be used effectively in regions with comparatively weak air defenses.

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F-20 TIGERSHARK TACTICAL FIGHTER

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 47-49

[Article by Col V. Yatkin; "The F-20 TIGERSHARK Tactical Fighter"]

[Text.] Not being satisfied with the enormous profits from the production and delivery of military equipment and weapons to the Pentagon, the bigwigs of the American industrial complex use various methods to expand the export of its deadly product to U.S. allies in the aggressive NATO bloc and other countries. Consequently, they do not shun any means, including the intimidation by the imaginary "Soviet military threat" and communist danger, the bribery of high-ranking officials of these countries, economic sanctions, etc.

One of the ways of conquering the international market for the sale of military products is the development of so-called inexpensive models, manufactured especially for sale to countries with limited financial capabilities. All this is manifested by the American administration in the form of rendering military aid. But it hushes up the fact, that the simple-minded buyers, having acquired American armament "at a suitable price," fall into Uncle Sam's trap and will find it necessary to pay many times over for the training of personnel, and for the delivery of spare parts and complex types of servicing and repair equipment, etc.

One such weapon type, intended for sale at an "acceptable" price is the F-20 TIGERSHARK tactical fighter, developed by Northrop.

The F-20 aircraft was developed on the basis of the F-5E TIGER-2 fighter, extensively deployed around the world and developed by the same firm. Therefore, it was originally designated the F-5G. Its first prototype (equipped with a double-flow turbojet engine with a maximum static thrust of 7,260 kg and the F-5E's onboard equipment) made its first flight in August 1982. In October, 1984, it crashed (by this time it had completed approximately 600 flights). The flight trials of the second F-20 aircraft prototype began in August, 1983. A more powerful engine (with a thrust of 8,150 kg) and more improved navigation, flight and other equipment, standardized for its serial production, were installed on it. The flight of the third F-20 prototype began in May 1984.

According to foreign press information, the F-20 aircraft is a single-seat tactical fighter, which can be used for aerial combat and the delivery strikes against ground targets. Structurally, it embodies an entirely metal monoplane with a low-set, almost planar trapezoidal-shaped wing (its wing sweep angle is 25 degrees per 1/4 chord) with sags/collars in the engine air intakes. The aircraft's fuselage is a semimonocone design made of light alloys with a limited number of joints and parts of steel and titanium alloys. The tail section is conventional, with a vertical fin and horizontal stabilizer. The mechanization of the wing, tail section, and air brakes has hydraulic drives. The landing gear is a retractable tricycle supported with a forward strut which extends during take-off. The outside view of the aircraft is shown in the color insert and its configuration in Fig. 2.

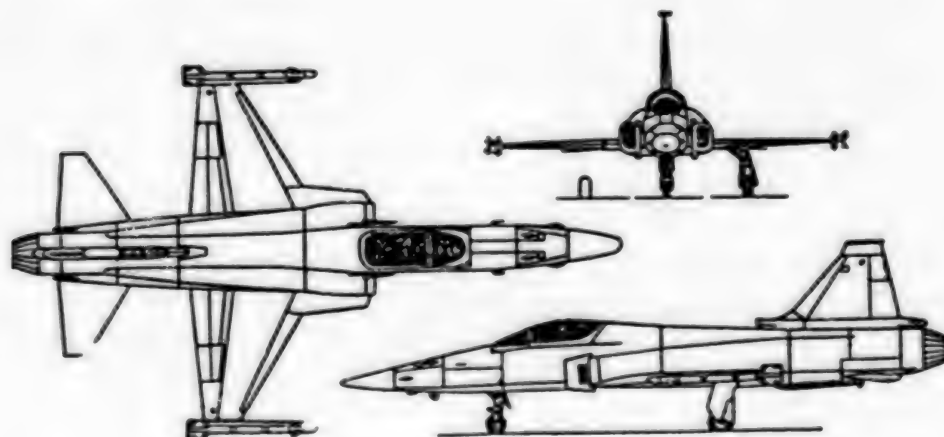


Figure 2. Projections of the F-20 TIGERSHARK Tactical Fighter

The F-20 is equipped with one F404-GE-100 double-flow turbojet engine with a maximum static thrust of 8,150 kg (with the afterburner on). The external fuel tanks hold approximately 3,000 kg of fuel. It can also carry additional fuel tanks (one under the fuselage with a capacity of 1040 liters and two under the wing with a capacity of 570 liters each) on external suspensions, which increases its flight range significantly.

As the Western press testifies to, it is planned to equip the serial aircraft with the most modern navigation, piloting and sighting equipment, including the AN/APG-67(V) multifunction onboard radar, an inertial navigation system with a laser gyroscope, a digital computer, a windshield information display system, a device for detecting the emissions of enemy aircraft radar, and active and passive ECM systems.

The aircraft's armament includes two built-in 20-mm M.9 aircraft cannons (with a 225 cartridge basic load). It can carry bombs, various types of guided and unguided missiles, additional fuel tanks, and pods for reconnaissance and

other systems on one under-fuselage station and four underwing stations for external suspensions. Additionally, two SIDEWINDER air-to-air missiles can be suspended on the windtip panels. The general payload weight is 3,800 kg.

American specialists consider that, although the F-20 fighter's weight is 21 per cent greater than its basic model, it has better tactical-technical characteristics and greater combat capabilities in comparison to the F-5E due to the installation of the more powerful engine, improved airframe and its outfitting with modern onboard equipment. The tactical-technical characteristics of both aircraft are presented in the table.

Tactical-Technical Characteristics of the F-5E and F-20 Aircraft

CHARACTERISTICS	AIRCRAFT	
	F-5E	F-20
Crew, personnel.....	1	1
Maximum Take-off weight (clean), kg.....	11,210(4,410)	12,470(5,360)
Maximum flight speed at high altitudes, Mach.	1.64	Approx. 2
Climb rate on the ground, m/sec.....	176	285
Service ceiling, m.....	15,790	17,315
Time to climb to 12,200 m altitude, sec.....	--	138
Take-off run (with maximum take-off weight, m	1,740	1,080
Landing run using a breaking chute, m.....	760	660
Ferry range, km.....	2,860	3,730
Operational radius (depending on payload, and flight mode and profile, km.....	220 - 1,050	500 - 1,200
Power plant (no. x type x maximum static thrust of the engines), kg.....	2 xTRD x2,270	1xTRDDx8,150*
Armament:		
Built-in cannons: no. x calibre (rounds per cartridge).....	2 x 20 (140 each)	2 x 20 (225 each)
Suspension armament (general weight, kg	Bombs, guided-missiles, rockets, tanks, pods. (3,175)	Bombs, guided-missiles, rockets, tanks, pods (3,800)
Aircraft dimensions, m:		
Length.....	14.45	14.19
Altitude.....	4.06	4.22
Wing span.....	8.13	8.13
2		
Wing area (m).....	17.30	18.60

* TRD-turbojet engine, TRDD-Double-flow turbojet engine

In trying to attract buyers, the firm's representatives are widely advertising the F-20 aircraft and proposing its services for the development of its new

modifications by rendering aid in organizing its production under license, etc. However, as the Western press testifies to, for the time being, no buyers for the F-20 have been found, although this issues is being looked into by military experts of many countries, especially those, which have the F-15 aircraft in the air force inventory.

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SPANISH NAVY

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 51-57

[Article by Capt 2nd Rank S. Vladimirov; "The Spanish Navy"]

[Text] The politico-military leadership of the North Atlantic bloc, in its aggressive preparedness, has assigned an important role to Spain, whose favorable geographic position, as emphasized in the Western press, allows her to control the regions of the western Mediterranean and Iberian Atlantic. Incorporation of Spain in the military structure of NATO (Spain joined the political organization in 1982) facilitates even broader military-economic ties with the U.S. and other governments, and members of the bloc who are aiding in building up Spain's armed forces, including its navy.

The Spanish Navy is an independent arm of the military forces, headed by a chief of the general staff (Commander of the Navy). According to the foreign press, the navy's missions are: combat against an enemy fleet; participation in amphibious and anti-amphibious operations; defense of the coast, naval bases and ports of continental Spain, the Canary and Balaeric Islands; and control of its territorial waters and economic zone. In connection with the preparations of ruling Spanish circles for their entry into the military organization of the aggressive NATO bloc, certain supplementary missions were levied on the navy, such as: screening the movements of NATO navy units from the Atlantic into the Mediterranean; defense of sea lines of communications (SLOC) in the Eastern and Iberian Atlantic, Strait of Gibraltar, and the western Mediterranean; combat against enemy submarines, surface ships and resupply transports transiting the Strait of Gibraltar; and maintenance of a favorable operational regime in its zone of responsibility.

The Spanish Navy is comprised of the fleet, naval aviation and marines. Resources are organized into five commands: the fleet, submarine forces, mine forces, naval aviation, and marines. In addition, the chief of the general staff of the navy (C-IN-C) commands three naval districts (the Strait Zone, Cantabrian, and Mediterranean) and the naval zone of the Canary Islands (Fig. 1).

The highest command element of the navy is the general staff which is responsible for developing plans for navy construction, combat implementation

and mobilization, and for recruiting and training personnel. It consists of four directorates (strategy, tactics, materiel and navy organization structure), as well as a naval aviation section.

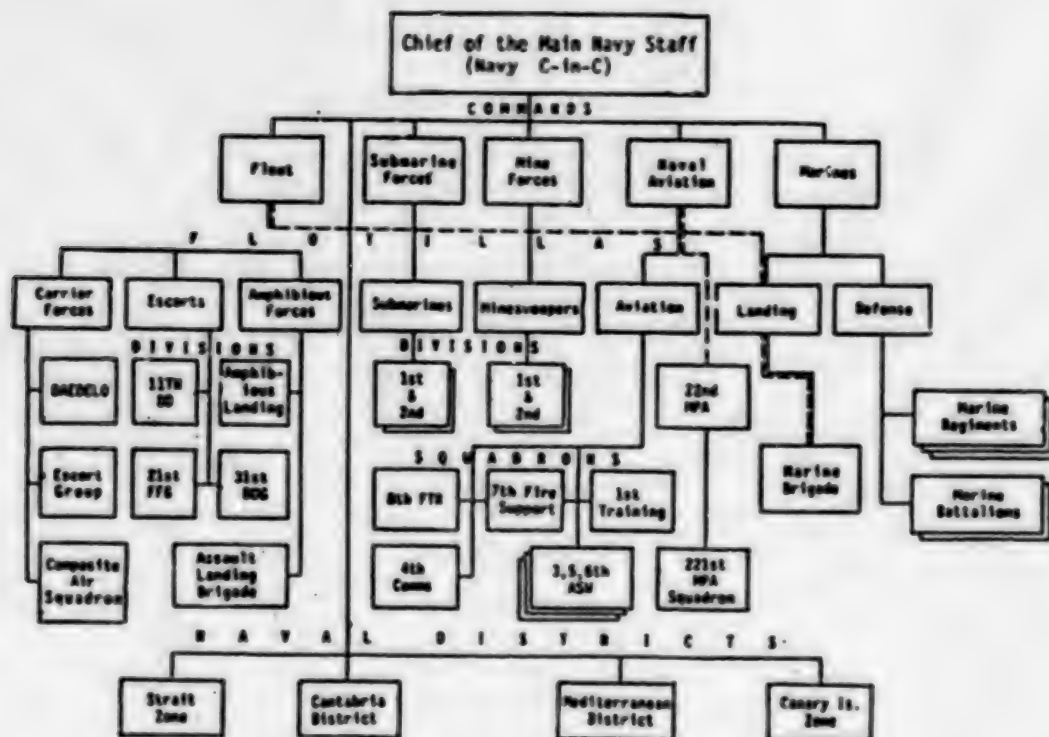


Figure 1. Spanish Navy Organizational Structure
(Dashed Lines Indicate Operational Subordination)

The total strength of the navy, according to JANE'S is 57,000 personnel, broken down as follows: 44,800 fleet and naval aviation personnel and 12,200 marines. Obligated service is 18 months.

THE FLEET. The Fleet Command (headquartered at El Ferrol) includes aircraft carrier forces, and flotillas of escort ships and amphibious forces. A flotilla of submarines, consisting of two divisions is under the Submarine Force Commander (Cartegena Naval Base), while the Mine Force Command (also at Cartegena) is represented by a flotilla of mine forces (two divisions).

Ship strength of the navy is about 60 combat ships, including 1 general-purpose aircraft carrier, 8 diesel submarines (torpedo attack), 5 DDGs, 7 FFGs, 9 amphibious ships, 12 minesweepers and 4 corvettes. In addition, the navy has more than 60 combat cutters of various designations and more than 100 various amphibious landing craft in their amphibious flotilla. The Spanish Navy has more than 140 auxiliary ships. Technical and military characteristics of the major ships are given in the table.

SPANISH NAVY SHIP TECHNICAL-TACTICAL CHARACTERISTICS

Class, No. in Fleet, SIDE NO., YEAR OF COMMISSIONING	Displacement (t) Standard Full	Length Beam Draft	Power	Cruising Range	Crew Size Officers ()	Weapons ¹
			Max Speed	Speed		
1	2	3	4	5	6	
CARRIERS						
PERALDI, 1 PERALDI (801), 1943	13,000 16,420	189.9 21.8 7.9	100,000 24	7,200 15	1,112 ² (--)	47-85 NATADOR YSTOL A/C - 7; Helicopters - 20: SH-30 SEA KING, AH-16 HUEY COBRA, AB-212 ASH; 40-mm gun 1 x 4 and 9 x 2
SUBMARINES						
GALERA ³ , 4 GALERA (S71) SIROCCO (S72) NISTRAL (S73) TRAMONTANA (S74) 1963-85	1,470 ⁴ 1,790	67.6 6.8 5.2	3,600 ⁵ (4,600) 12 (28)	8,500 (180) 9 (3.5)	50 (--)	550-mm torpedoes - 4 tubes (20 torpedoes or 9 torpedoes and 19 mines ⁶)
DELFIN ⁷ - 4 DELFIN (S61) TOMONA (S62) NARAJOSA (S63) NARVAL (S64) 1973-75	870 1,040	57.8 6.8 4.6	1,224 (2,400) 13 (15)	4,300 (150) 7.5 (3.5)	47 (6)	550-mm torpedoes - 12 tubes (12 torpedoes)
GUIDED MISSILE DESTROYERS						
BALAERIC - 5 BALAERIC (F71) ANDALUSIA (F72) CATALONIA (F73) ASTURIA ⁸ (F74) ESTREMEIRA (F75) 1973-76	3,000 4,180	133.5 14.3 4.7	35,000 30	4,500 20	256 (15)	HARPOON 2x4; TARTAR(16 STANDARD) ASROC 1x2; 127-mm gun 1x1; 324-mm torpedo tubes 4x1; 533-mm torpedo tubes 2x1
DESTROYERS						
ROGER de LAURIA - 1 MARQUES de la ENSENADA (D43), 1970	3,000 3,725	119.3 13.8 5.6	60,000 28	4,500 15	318 (20)	127-mm gun 3x2; 324-mm torpedo tubes 2x2; 533-mm torpedo tubes 2x1; MACHES 500N helicopter
CHURRUCIA ⁹ - 5 CHURRUCIA (D61) REBOEZ MUNEZ (D63) REAYINA (D62) LANGARA (D64)	2,425 3,480	119.8 12.6 5.8	60,000 34	4,800 15	274 (17)	ASROC 1x2; 127-mm gun 2x2; 324-mm torpedo tubes; MACHES 500N helicopter

SPANISH NAVY SHIP TECHNICAL-TACTICAL CHARACTERISTICS (CONT'D)

Class, No. in Fleet, SIDE NO., YEAR OF COMMISSIONING	Displacement (t) Standard Full	Length Beam Draft	Power	Cruising Range	Crew Size Officers (1)	Weapons ¹
			Max Speed	Speed		
1	2	3	4	5	6	

DESTROYERS (CON'T)

BLAS de LEZO (D45) 1915						
LEPANTO ¹⁰ - 4						
ALMIRANTE FERRANDIZ (D22)	2,100	114.7	60,000	5,000	290	127-mm gun 3x1 (D21/22) or 4x1; 40-mm 3x2 and 20-mm 6x1 (D21/22); 76-mm 3x2 (D23-25); 324-mm torpedo tubes 2x3; 533-mm tubes 3x1 (D23-25); hedgehog - 2, ASW rockets - 2 (D21) or 1 (D22-25)
ALMIRANTE VALDES (D23)	3,050	12.1	34	15	(17)	
ALCALA GALLIANO (D24)		5.5				
JORGE JUAN (D25) 1943						

GUIDED MISSILE FRIGATES (FFG)

OLIVER H. PERRY - 1 SANTA MARIA (F10) 1986	-- 3,600	135.6 13.7 7.5	46,000 30	4,500 20	201 (13)	HARPOON - 16; TARTAR - 24 STANDARD MISSILE; 76-mm gun 1x1; 20-mm M60A 1x12; 324-mm tubes 2x3; 375-mm BOFORS ASW rockets 1x2
DESCUBIERTA - 6						
DESCUBIERTA (F31)	1,233	88.8	16,000	4,000	116	HARPOON 2x4; SEA SPARROW or ALBATROSS 1x8; 76-mm gun 1x1; 40-mm gun 2x1; 324-mm torpedo tubes 2x3; 375-mm BOFORS ASW rockets 1x2
DIANA (F32)	1,479	10.4	26	10	(-)	
INFANTA ELENA (F33)		3.2				
CAZADORA (F35) YENCEDORA (F36) 1970-82						

LANDING SHIP DOCK

CABILDO - 1 GALICIA (L31) 1945	4,790 9,375	145.0 23.2 5.5	7,000 15	8,000 15	310 (18)	40-mm 2x4/2x2; amphibious capacity: LCU - 3 or LCH - 10 (1,347 t) or 100 2.5 t vehicles or 27 medium tanks; 137 marines
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SPANISH NAVY SHIP TECHNICAL-TACTICAL CHARACTERISTICS (CONT'D)

Class, No. in Fleet, SIDE NO., YEAR OF COMMISSIONING	Displacement (t) Standard Full	Length Beam Draft	Power	Cruising Range	Crew Size Officers ()	Weapons ¹
			Max Speed	Speed		
1	2	3	4	5	6	

AMPHIBIOUS TROOP TRANSPORT

PAUL REYER - 2						
CASTILLA (121)	10,700	171.8	22,000	10,000	414	
ARAGON (122)	16,836	23.1	22	20	(35)	76-mm guns 4x2; capacity 1,657 marines
1958-61		8.2				

TANK LANDING SHIPS

TERRENOE PARIEN - 3						76-mm guns 3x2; capacity:
VELASCO (111)	2,700	117.0	6,000	15,000	116	10 medium tanks or 17
MARTIN ALVAREZ (112)	5,800	16.8	15	9	(-)	amphibian armored trans-
CONDE del VERADELITO (113)		5.2				ports; 4 landing craft;
1952-54						395 marines
LCT - 3						12.7-mm machine gun -2;
LCT (6-8)	279	59.8	1,000	1,500	17	81-mm mortar - 1; capacity
1966	665	11.9	9	9	(-)	5 medium tanks or 310 t
						cargo; 500 marines

NOTES

1. The number of missile and artillery installations, number of barrels as well as the number of torpedo tubes, rocket launchers and tubes are indicated by numbers and a multiplication sign.
2. Gives the composite air squadron personnel.
3. Duplicate of the French submarine *AGOSTA*.
4. For submarines, the top number is surface displacement, the lower, submerged.
5. Numbers without parenthesis are surface characteristics, inside are submerged.
6. Submarines of this type may be armed with EXOCET (fired through torpedo tubes).
7. Same as the French submarine *DAPHNE* in Fig. 2.
8. The *DOG ASTORIA* (774) is shown in Fig. 3.
9. Former U.S. *GEARING*-Class destroyers (modernized in the *FRAN-1* program), transferred to Spain in the early 1970s.
10. Former U.S. *FLETCHER*-Class destroyers, transferred to Spain at the end of the 1950s and early 1960s.

Toward the end of 1986, and the beginning of 1987, the aircraft carrier R11 PRINCIPE DE ASTURIAS, built pursuant to a U.S. program, will enter the fleet as a replacement for the carrier R01 DEDALO. According to the foreign press, it will have the following military and technical characteristics: full displacement, 14,000 tons; length, 195.1 m; beam, 24.4 m; draft, 9.1 m; main power plant (2 LM2500-type gas turbines), 46,000 hp; maximum speed, 26 kts; cruising range, 7,500 mi at 20 kts. The ship can accommodate 20 aircraft (6-8 AV-8B VSTOL fighter-bombers, 6-8 SH-3D SEA KING helicopters and 4-8 AB212 ASW helicopters). Inner air defense systems include four 12-barrel 20-mm guns of the MEROKA system. Crew size (minus the composite squadron personnel) is 790.



Figure 3. BALAERIC-Class Guided Missile Destroyer ASTURIA

Four ATREVIDA-Class corvettes were reclassified from the frigate designation in 1980. Their full displacement is 1,135 tons, standard is 1,031 tons; length, 75.5 m; beam, 10.2 m; draft, 3 m. After removing their ASW armament, the only remaining ship's armament were a 76-mm gun each and three 40-mm gun installations each. They can also carry up to 20 mines.

The mine forces are represented by four ocean-going AGGRESSIVE-Class minesweepers and eight ADJUTANT-Class inshore minesweepers built in the U.S. in the 1950s, and later transferred to the Spanish Navy. In foreign defense specialists' opinion, they have a limited capability to search and sweep mines.

Landing ships and craft include a CABILDO-Class landing ship, dock, two PAUL REVERE-Class transports, three TERREBONE PARISH-Class tank landing ships (all of U.S. construction and transferred to Spain in the period from 1971 to 1980) and three Spanish-built LCT-Class tank landing ships.

Of their patrol boats, the most combat-capable appears to be the six LAZAGA-Class guard ships (PC01-06, Fig. 4) built in 1975-77. They have a full displacement of 399 tons; length, 58.1 m; beam, 7.6 m; draft, 2.6 m. The power of their propulsion plant is 8,000 hp with a maximum speed of 30 kts and a cruising range of 6,100 mi at 17 kts. Each ship is armed with one 76-mm and

one 40-mm and two 20-mm guns. In 1986-87, these ships will be equipped with the HARPOON anti-ship missile.

NAVAL AVIATION is organizationally structured into an aviation flotilla, which has seven squadrons: the 8th Fighter Bomber Squadron with AV-8S MATADOR aircraft; the 7th Fire Support Helicopter Squadron with AH-1G HUEY COBRAS; the 1st Training Squadron (AB.47G helicopters); the 4th Communications Squadron; the 3rd (AB.212 ASW helicopters), 5th (SH-3D SEA KING) and the 6th (Hughes 500M) ASW helicopters. In operational relationships, the air force's 22nd Patrol Air Wing is subordinated to the navy.

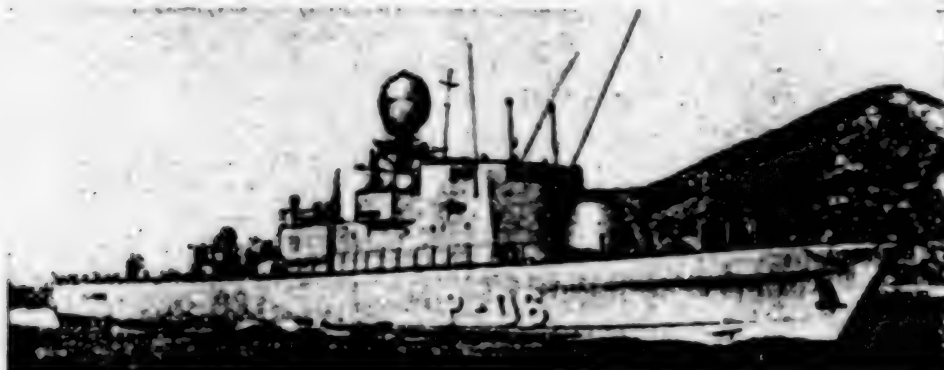


Figure 4. LAZAGA-Class Guard Ship REXALDE

Naval aviation has the following order of battle: 8 AV-8S fighter bombers (Fig. 5), 2 TAV-8S MATADOR combat trainers, ASW helicopters: 14 SH-3D SEA KING, 11 AB.212, 11 AB.47G trainers, 11 Hughes 500M, 4 HUEY COBRA fire support; 6 communications aircraft. The air force 22nd Patrol Air Wing is equipped with 6 M-3A ORION maritime patrol aircraft.



Figure 5. AV-8S Fighter-Bomber on the Deck of the Carrier R01 DEDALO

SPANISH MARINES consist of amphibious forces (a marine brigade) and elements of naval target defense forces (southern, northern and eastern regiments of marines and two detached marine battalions). The marine brigade for operational purposes is subordinated to the fleet commander. Marine equipment includes M48 tanks, 155-mm self-propelled howitzers, 105-mm self-propelled and towed cannon, 120-, 81-, and 60-mm mortars, 106-mm recoilless rifles, TOW and DRAGON anti-tank missiles and LVTP-7 amphibian armored personnel carriers.

MILITARY DISTRICTS AND ZONES are divided into naval provinces and have an assigned naval staff, LEPANTO-Class destroyers, patrol and tank landing ships and coastal patrol cutters.

According to the naval command's view, the purposes of combat utility and their preassignment, the naval ships, aviation and marines are allocated to combat forces, screening forces and auxiliary forces. As Spanish defense specialists point out, the following units and elements are assigned to the combat forces: a carrier battle group (CV R01 DEDALO, 5 BALAERIC-Class DDGs, and a composite air squadron); naval aviation; a submarine flotilla and a flotilla of landing forces, a marine brigade and support forces (12 escort ships).

Screening forces include forces for SLOC defense (five CHURRUCA-Class DDs and one ROGER DE LAURIA, six DESCUBIERTA-Class FFGs, mine forces and base defense forces (three regiments and two detached battalions of marines).

Auxiliary forces consist of: the mobile rear security unit (oiler-replenishment ship TEIDE, the transport CASADO, three tank landing ships, rescue ship POSEIDON, five ocean-going tugs and six water carriers); patrol force (four LEPANTO-Class DDs, and four ATREVIDA-Class covettes) along with six hydrographic and two training ships.

OPERATIONAL AND COMBAT TRAINING OF THE SPANISH NAVY, as noted in the foreign press, is aimed at increasing the combat readiness of fleet aviation and marine forces and systems, and, in light of the broadening military ties with the aggressive NATO bloc, at exercising joint operations with fleets of the other members.

In 1985, the Spanish Navy participated in one exercise of the national armed forces. The fleet took on more than 60 national and joint exercises of various levels with the navies of the U.S., France, Portugal, Italy, Germany, the U.K., the Netherlands, Greece and Morocco. Marine amphibious forces carried out 12 exercise-training landings and 9 exercises to practice combat operations of marines on the shore. Elements of the naval defense force participated in 85 tactical and 5 command post exercises. Overall, in combat training, they executed over 134 combat drills for organization for air defense of ships at sea using tactical air force aviation and 62 with aircraft and helicopters of naval aviation; 25 times, the forces of the navy dispersed for the operational security and combat readiness and more than 40 times in the support of ground forces. In 1985, the total at-sea time for Spanish submarines (submerged) was about 7,000 hours, and general naval aviation flight time, 13,000. In addition, the Spanish Navy underwent 80 deployments (total duration, 762 days) for patrol duties in the economic and fishing

zones. Auxiliary ships deployed more than 70 times in support of the continuous navy operations.

NAVY BASING The main bases of the Spanish Navy are: on the Atlantic coast, El Ferrol; in the Strait of Gibraltar, Cadiz, the Puntales amphibious base and the staging point at Tarifa; on the Mediterranean coast, Cartagena; in the Canary Islands, Las Palmas; and in the Balearic Islands, Palma.

Naval bases, as emphasized in the foreign press, have available an well-developed system of depots, arsenals, and ship repair facilities. In all of them, there are schools and centers for personnel training. Technical training for naval air crews is conducted at air force facilities.

PROSPECTS FOR DEVELOPMENT. According to the foreign press, the Spanish Navy is undergoing a widespread program of upgrading and modernizing its ship and aviation forces. Construction of the light carrier PRINCIPE DE ASTURIAS is nearing conclusion (one more ship of this class is expected to be built), construction is ongoing of a series of five units of the OLIVER H. PERRY-Class FFGs, and the first will be turned over to the fleet by 1988. For the future, according to the publication, JANES, by 1996, Spain is planning to build three submarines, one or two DDGs, five frigates and FFGs, four minesweeper-minehunters and eight inshore minesweepers, six missile boats, a supply ship, an air cushion dock landing ship, four tank landing ships, three corvettes and one training sailing ship.

A contract has been signed for delivery of twelve AV-8B HARRIER-2 fighter-bombers, which will be aboard PRINCIPE DE ASTURIAS in 1987. Spain is also planning the purchase of six SH-60B SEA HAWK helicopters LAMPS MK3 for the OLIVER H. PERRY-Class FFGs.

In addition, they are planning to complete installation of the HARPOON anti-ship missile on DESCUBIERTA-Class FFGs and on LAZAGA-Class corvettes, and to modernize the fire control systems on DELPHIN-Class submarines. Considerable work is planned in modernizing BALAERIC-Class DDGs. These will have installed a new control system as well as a new EW system, and the 20-mm AA close-in defense system (MEROKA). Some modernization is planned for the DESCUBIERTA-Class FFGs (EW systems). Ships of various classes will be equipped with systems for passive EW interference (with systems for firing unguided rockets filled with angle reflectors or chaff). They are also planning to convert three SH-60D helicopters into AWACS.

According to the foreign military experts, completion of these programs can move the Spanish Navy into the list of capable and powerful navies of Western Europe.

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AIRCRAFT CARRIERS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 57-62

[Article by Capt 1st Rank (Reserve) Yu. Petrov; "Aircraft Carriers"]

[Text] The military-political leadership of the U.S., in its aggressive plans, is paying great attention to establishing maritime superiority as one of the primary conditions of guaranteeing combat actions in the transoceanic TVDs, especially in the European. In realizing these plans, an important role is assigned to aircraft carriers, which are viewed as primary warships well out into the future. By virtue of their universality, high combat stability and mobility, they comprise the centerpiece of surface ship strike groups. The multipurpose carrier group (CVBG), is capable of transiting distances of up to 700 miles per day at speeds around 30 knots, which make them difficult to detect and permits them to employ carrier-based aircraft without warning. The CVBG can remain at sea up to 30 days, supplies of aviation fuel allow intensive flight activity (with two flights daily of each aircraft) for 16 days for a nuclear carrier and 8 for a conventional. Strikes against the shore can be made to a depth of 1,800 km. Ordinarily, a CVBG is comprised of one carrier, one or two guided missile cruisers, two or three DDGs, two DDs, one or two fast replenishment ships and one nuclear submarine. The forces of a CVBG, along with maritime (landbased) patrol aircraft form up in a circular echeloned defense at depths of 360-600 km against ships and strike air forces.

The aircraft and helicopters based on the CV, comprising its airwing, are the main strike force. Typical aircraft in an airwing are:

- 12 A-6E INTRUDER medium bombers
- 28 A-7E CORSAIR light bombers
- 24 F-14A TOMCAT fighters or F/A-18 HORNETs
- 10 S-3A VIKING ASW aircraft
- 8 SH-3H SEA KING ASW helicopters
- 4 EA-6B PROWLER electronic warfare aircraft
- 4 E-2C HAWKEYE early warning and command aircraft
- 4 KA-6D INTRUDER airborne tankers

When the carriers operate in forward areas, one or two EA-3B SKYWARRIOR SIGINT aircraft are carried on board. The complement of the airwing is not always

constant and depends on the type of carrier and its specific missions. Table 1 displays the military and technical characteristics of carrier-based aircraft.

Table 1 MAIN CHARACTERISTICS OF CARRIER-BASED AIRCRAFT

Designator and Name	Crew	Maximum Speed, kmph at (alt, m) Operating Range, km	Take-Off wt, kg Ceiling, m	Weapons
U.S.				
F-14A TOMCAT	2	<u>2,500 (12,000)</u> 700 - 1,200	<u>33,700</u> 17,000	20-mm VULCAN, SIDEWINDER, SPARROW, PHOENIX, 6,500 lbs bombs
F/A-18 HORNET	1	<u>1,900 (11,000)</u> 750 - 1,100	<u>25,400</u> 15,240	20-mm VULCAN, SIDEWINDER, SPARROW, PHOENIX, 600 lbs bombs
F-4E CRUSADER	1	<u>1,900 (12,000)</u> 700 - 1,100	<u>15,400</u> 15,800	4 20-mm cannons; SIDEWINDER; R.530, R.550; BULLPUP; 2,300 lbs bombs; ASR
A-6E INTRUDER	2	<u>1,000 (11,000)</u> 600 - 1,700	<u>27,400</u> 13,600	BULLPUP; 6,800 lbs bombs
A-7 CORSAIR	1	<u>1,100 (--)</u> 370 - 900	<u>19,000</u> 13,000	20-mm VULCAN, SIDEWINDER, BULLPUP, SHRIKE, ASR, 6,800 lbs bombs
S-3A VIKING	4	<u>900 (--)</u> 850 - 3,700	<u>23,800</u> 10,700	Torpedoes, mines, 4,500 lbs bombs ASR
EA-6B PROWLER	4	<u>980 (--)x</u> 1,300	<u>29,500</u> 11,600	EV suite
E-2C HAWKEYE	5	<u>560 (3,000)</u> 320	<u>23,500</u> 9,400	RADAR and EV equipment
FRANCE				
SUPERINTENDANT	1	<u>1,100 (11,000)</u> 700	<u>11,500</u> 13,700	2 30-mm cannons, MAGIQU, AS.30 EXOCET, 2,300 lbs bombs, ASR
BREGU 1050 ALIZE	3	<u>470 (3,000)</u> 600	<u>8,200</u> 6,250	AS-12, torpedo, depth bombs (975), ASR

x Characteristics of the aircraft are given with the suspension points required for five EV pods.
ASR = Air-to-Surface unguided rockets.

There are currently in the inventory of foreign navies carriers with nuclear power and conventional (steam turbine) propulsion. Since the mid-1960s, construction of nuclear carriers has been accomplished only in the U.S. This is primarily connected with the high cost of construction (estimated at 4 billion dollars) and with the complexity of the work. Last year in France it was decided to begin development of two nuclear carriers, which, in the second half of the next decade, will replace the conventional class CLEMENCEAU. The shift in the U.S. toward construction of exclusively nuclear carriers is explained by their substantive advantages over conventional: practically unlimited cruising range; improved conditions for flight operations (no smoke on the flight deck); minimal corrosive erosion of antenna systems in view of the absence of stack gases; the capability to sustain full speed for long periods of time; the lack of a requirement to supplement boiler fuel and deficit steam when operating several catapults simultaneously while at full speed. Foreign specialists have noted that the nuclear carrier CHESTER W. NIMITZ has aviation fuel tanks with a capacity twice as large and it carries aviation armament 1.5 times greater than FORRESTAL.

By the middle of 1986, there were 14 carriers in the U.S. Navy: 3 CHESTER W. NIMITZ-Class nuclear carriers, 1 ENTERPRISE, 4 KITTY HAWK-Class conventional carriers, 4 FORRESTAL-Class conventional carriers, 2 MIDWAY-Class (Fig. 1). THEODORE ROOSEVELT, the fourth NIMITZ-Class, will enter the fleet at the end of this year and the next two, ABRAHAM LINCOLN and GEORGE WASHINGTON, will join the fleet in 1989 and 1991, respectively. Simultaneously with construction of new carriers, the U. S. plans to extend the service life of those in commission by 15 years and keep them for up to 45-50 years. In summary, by the end of this decade, according to the foreign press, there will be 15 actual ships in commission which will enable the formation of 15 CVBGs. Basic characteristics of these carriers are displayed in Table. 2.

In the French Navy there are two CLEMENCEAU-Class carriers, each of which has on board 10 F-8E CRUSADER fighters, 16 SUPER ENTENDARD fighter-bombers, 7 BREGE 2050 ALIZE ASW planes (with limited EW capability), 3 reconnaissance aircraft (airborne refueler as well) ENTENDARD 4P, and 2 multipurpose SA316 ALOUETTE helicopters.

An aircraft carrier is a mobile system designed for assuring airwing aircraft operational activity in complex operational-tactical situations and in all kinds of weather. It not only carries out functions of a landing and takeoff strip, it also performs constant service and repair of aircraft; which is the fundamental condition of maintaining them in constant battle readiness. The aircraft are considered the specific element on which depends the majority of requirements levied on the ship. Their composition and characteristics have a strong influence on the ships' construction particulars and especially on its flight deck.



Figure 1. American Carrier MIDWAY CV-41

All French and American carriers in commission are designed with an angled deck which increases landing and takeoff safety and makes it possible to do both simultaneously, it decreases the interval between landings and establishes better conditions for landings. The landing element of the deck is located on the angled deck, the disposition and size of which is derivative from the following conditions. It is laid out at an $11-13^{\circ}$ angle to the centerline (8° on CLEMENCEAU due to its smaller size. Any larger angle would interfere with the pilot's orientation on landing path; and its forward edge for seakeeping purposes must deviate from the stem no less than for one-third the length of the ship.

Modern aircraft (landing speed of 270 km/hr) can land only with the aid of arresting gear; a hydraulic braking system(1). In these systems a piston displaces brake fluid from a cylinder into an air storage cell, compressing the air inside, which, when it expands, returns the piston and its connected braking cable to its original position. The energy capacity of modern arresting systems (Mk7, Mod 3), with a 600 m cable is about 7×10^6 kg force/meter. Carriers now have installed a 4-barrier arresting gear each about 12 ± 1.5 meters apart, which helps in avoiding cable entanglement. In addition, there is an additional emergency barrier in the form of a nylon net, whose cables are connected to a similar braking system.

Table 2
MAJOR AIRCRAFT CARRIER TACTICAL-TECHNICAL CHARACTERISTICS

Type Carrier, Number in Fleet, Year of Commissioning	Displacement, t Standard Full	Principle Dimensions, m Length Beam Draft	Power Plant Type HP	Full Speed, kts Cruising Range (at Speed)	Crew (Number in Flight Crew and Technical Staff)	Weapons
U.S.						
C. W. MINTZ - 3e 1975-82	81,600 91,500	332 78.8 - 78.4 11.3	Nuclear 260,000	30 Unlimited	3,300 (3,000)	SEA SPARROW, 3; VULCAN- PHALANT, 3-4
ENTERPRISE - 1 1961	75,700 90,970	342.3 40.5	Nuclear 280,000	35 Unlimited	3,100 (2,400)	SEA SPARROW, 3; VULCAN- PHALANT, 3; 20-mm guns, M16, 3
CITIZEN - 4 1961-1968	60,000 - 61,000 79,700 - 81,800	319 - 321 76.9 11.3	Steam Turbine 260,000	30 12,000 (18)	2,800 (2,150)	SEA SPARROW, 3; VULCAN- PHALANT, 3-4
FORESTAL - 4 1955-1959	59,000 - 60,000 79,300 - 80,600	324 - 331 76.8 11.3	Steam Turbine 260,000 - 280,000	30 - 34 11,000 (18)	2,790 (3,390)	SEA SPARROW, 2; VULCAN- PHALANT, 3
MIDWAY - 2 1945-1947	51,000 - 60,000 64,000 - 65,000	298.4 72.5 10.8	Steam Turbine 212,000	30 - 34 12,000 (15)	2,710 (2,260)	SEA SPARROW, 2; VULCAN- PHALANT, 3
FRANCE						
CLEMENCEAU - 2	27,300 32,760	265.0 51.2 8.6	Steam Turbine 125,000	32 12,000 (18)	1,338	100-mm automatic gun, 8

e Two additional MINTZ-Class carriers are programmed for entry into the fleet in 1990 and 1991.

According to the foreign press, when landing, the aircraft must maintain a glide path within 3.5° . In this case, the clearance between the landing hook and the stern edge of the ship is 3 m, which assures contact with the deck and seizure of a wire of the braking system 55 m from the edge of the stern. It is desirable that hooking take place between the 2nd and 3rd wire. A deviation off centerline on the angled deck of 6 m is permissible, as is landing at 7° off center when catching the bow wire. After landing, the aircraft run out from 75 to 105 m. Approximately another 35 m is needed to maneuver out of the landing zone. Overall, the angled deck length is 230 m. Outside the landing zone to the left and right of it are safety areas. One of these is situated no less than 15 m from the longitudinal axis on the starboard side. A demarcation line runs along the arresting wires and further on up to the bow section of the angled deck. On the port side, the demarcation line is found for some great distance.

The aircraft weigh about 35 tons and at a takeoff speed of up to 250 kmph can be airborne with just the aid of catapults, whose track length is relative to the acceleration to be achieved (no greater than $5.5g$) or about 95 m, which actually designates the length of the takeoff part of the flight deck. Its overall length is 340 m, with a 77 m beam. These dimensions have been maintained with no substantive change for the last 30 years. All American carriers of post-war construction have four steam catapults, two in the bow and two on the angled deck (before this, they had hydraulic catapults with a maximum power of $2.8 \times 10^6 \text{ kg} \times \text{m}$). The energy of the latest model catapult (C-13-1) reaches $14.4 \times 10^6 \text{ kg} \times \text{m}$. French carriers have two BS5 catapults of British manufacture (50 m long) which can get airborne aircraft weighing 10-15 tons at speeds of 205 kmph.

The principle of all catapult systems is unique. Pistons move in two parallel cylinders beneath the flight deck, to which are connected a shuttle which runs freely along the catapult track. When starting up, steam is introduced into the cylinders at $45\text{--}84 \text{ kg/cm}^2$ accelerating the pistons which afterwards are returned to their original position by a hydraulic mechanism. Air speed is assured after two seconds following the run of the shuttle down the whole length of the track. The shuttle speed is adjusted depending on the situation and the weight of the aircraft to be catapulted. A basic deficiency of steam catapults is that the expenditure of steam, when operating, is about 20 to 25 per cent of the entire steam-generating capacity of the boilers. Aircraft take off at 45 second intervals and land from 30 seconds to 1.5 minutes apart in bad weather. When on the catapult, aircraft steering is automatic, hydraulically controlled. It is kept on the axial line by two parallel energized conductors, which create an electromagnetic field. A change in its in its voltage is received by on-board sensors, which emit correcting commands to the aircraft's control system.

An automatic, all-weather takeoff and landing system, the AN/SPN-42, guarantees a high intensity of carrier air operations. It includes a tracking radar, stabilized navigation system and a panel reflecting the air situation. The system allows simultaneous release for landing of two planes within 20 seconds. Once the aircraft's onboard equipment is linked up with the ship's system, the equipment automatically guides the aircraft to the arresting wires. To improve reliability, it has a supplementary independent command and

control system for blind landing which incorporates the ship's AN/SPN-41 radar and the onboard equipment, AN/ASW-25A, which is a line of transmitted data. The aircraft enters a beam, formed by an antenna, five miles across and 3.5 miles high at a distance of 18-20 miles, then receives a coded signal, which its AN/ARA-63 receiver-decoder converts into information about the condition of the aircraft and displays on an indicator within the cockpit. The system controls landings of several aircraft, accomplishing it simultaneously with different glidepaths. The flight deck in the take-off area is covered with water-cooled aluminum panels to protect against corrosion. For the catapults, cooled water panels of honeycomb construction are installed as deflectors of the jet gasses from the aircraft engines.

A covered hanger deck lies below the flight deck. The hanger occupies 60-70 per cent of the ship's length (on NIMITZ its length and beam are respectively equal to 265 and 38 m and on CLEMENCEAU, 152 and 26.6). It is 7.6 m high, which corresponds to the normal height of three interdeck spaces. General volume of the hangar is almost 25 per cent of the ship's overall volume.

In the interests of safety against fire, the hangars are divided into 2-4 autonomous sections by curtains, which, in normal conditions, are held in a furled condition on the hangar ceiling. Since hangars are designated not only for parking aircraft, but also to check them, provide pre-flight service and ammunition supplies, the hangars are supplied with systems for delivery of aircraft fuel, oxygen, compressed air, and electrical power. Hangars also have fire extinguishing sprinkler systems, foam extinguishers, and water sprinklers, as well as lifting equipment and tractors to move aircraft and tow them to the aircraft elevators. They are constantly improving their firefighting equipment. All aircraft carriers have fire engines delivering foam at 11,360 liters/minute; flight decks are equipped with sprinkler systems installed at 17 fixed automatic firefighting systems. They are disposed along the sides, and each puts out 3,780 liters of foam per minute, which is directed by monitors to the site of the fire within 30 seconds following an alarm signal.

An increase in the aircraft's combat load has required the growth in magazine capacity of combat supplies, to expand the number of equipments for control, collection and transportation of ammunition, and to increase the weight of airborne equipment on the ship. Simultaneously with the growth of carrier displacement, the share dedicated to air armaments has increased, which, in the case of JOHN F. KENNEDY, consists of 2.44 per cent, and for the CHESTER W. NIMITZ-Class is 3.15 per cent. The continuing service and medium level repair of aircraft also requires large areas for workshops and spare parts storage. Ammunition is supplied to airplanes by elevators, carts, and other lifts. Aircraft are lifted to the flight deck and transported back to the hangar deck by means of elevators of 45-ton capacity and a lift time (or return down) of 15 seconds. U.S. carriers have only side-located elevators, while the French ships have both side and deck elevators. With the latter in the flight deck, there are openings which impinge the integrity of the deck and create obstacles to maneuvering aircraft. In addition, in the event aircraft dimensions should change, it would require considerable structural work to accommodate them. The side-lifting elevators are outside the aircraft movement zone, and if they are damaged, it would not interfere with flight

operations, and the tail and fuselage of the aircraft can extend beyond its boundaries. At the same time, in the event of wave damage, water can enter the hangar. All new ships have four elevators each: three on the starboard (two bow and one astern of the superstructure) side and one on the port side in the after section of the angled deck. As a rule, an elevator services one section of the hangar deck.

U.S. specialists note that carriers have great survivability. Thus, it would take from 7-12 antiship missiles to put one out of action and no less than 20 to sink it. Survivability is achieved through a highly developed system of built-in protection, a large capacity for water drainage and firefighting systems, and armored flight deck and lower decks, combat stores spaces, power systems and aviation gas tanks. For example, on the FORRESTAL-Class ships, the thickness of the side armor at the waterline is 150 mm. In their construction, great attention was paid to reducing their physical fields, power equipment noise, and to lowering their effective dispersion zone. All important equipment weighing up to 18 tons is tested for shock resistance and for heavier gear and its foundations, stability, and dynamic loading is taken into account.

The remaining measurements of the hull are dependent on the dimensions of the flight deck and the hangar and are specified by a form coefficient and the dimensions of existing drydocks, as well as harbor and channel depths. Width of the hull at the waterline is about 40 m and draft does not exceed 11.3 m. The height of the side above the waterline (freeboard), depending on the class of ship, is somewhere between 12 and 24 m so as to prevent flooding of the hangar deck. Height of the hull comprises about 10 per cent of its length.

Carrier armament includes air defense missiles and guns for defense against low-flying air targets, especially anti-ship missiles. On U.S. ships, these are integrated (commencing with KITTY HAWK), into three 8-round cannon installations of the SEA SPARROW air defense missile (guided missile with semiautomatic guidance and a range of about 15 km), and 3-4 20-mm VULCAN-PHALANX AA systems. Similar systems have been installed in FORRESTAL-Class carriers during SLEP. The CLEMENCEAU is armed with eight single-shot 100-mm automatic guns (firing rate of 60 rds/min), with an altitude of 11,000 m. During routine repair, four gun systems are intended to replace the 8-shot cannon installation NAVALE CROTALE (guided missile with radio-controlled command and infrared guidance, and a 8.5 km range at a speed of Mach 2.5).

Electronic warfare equipment includes long-range air and surface search radar, controlling air movement and missile and gun fire, as well as navigation. It can detect air targets at 3,000 m altitudes at ranges up to 500 km and surface targets at 50-60 miles. The most modern radars include the AN/SPS-48C (three dimensional) AN/SPS-43A. 49. 67. 64. 10F and LN-66. The TACAN radio navigation system is installed as well, along with an EW system and a six-barrel launcher for deployment of 127-mm false targets, communications systems working in all radio frequency bands used by the U. S. Navy, and the NTDS tactical data link. The ships are equipped with a main flag bridge and an ASW center with displays, indicating computer-processed data on the tactical situation.

The keel for RICHELIEU, the first French nuclear-powered carrier, was laid in January, 1986; she will enter the fleet in 1995, and the second in the series will enter at the end of the 1990s. In their architectural design and construction, they will be similar to those ships discussed above. As the foreign press has noted, experience of U.S. specialists was extensively used in this project. According to preliminary estimates, the ships will displace around 40,000 tons, which will provide basing on board for 40 airplanes and helicopters. Several unusual features include the disposition of the "island" which will be separated, in the forward section, from the central part of the ship. Main waterline dimensions are 239 x 31.8 x 8.2 m. The hangar (138 x 29.4 x 6.1 m) permits servicing of about 20 airplanes. Flight deck dimensions are 261 x 62 m; its landing segment is laid out at an 8.5° angle. With many dimensions greater than those in CLEMENCEAU, flight deck area has been increased almost by 50 per cent, and is equivalent to 12,000 m². They intend to install two U.S. steam catapults (C-7, 75 m long and with 7.10⁶ kg x m power rating), which handles aircraft of 15-20 tons. One of them will be on the port side on the angled deck and the other in the bow section also on the port side, which permits, in case of necessity, the installation of a bow "ski lift" for VSTOL aircraft. The bow catapult deflector is partially located on the angled deck. As noted in the foreign press, this can create difficulties when conducting takeoffs and landings simultaneously. A three-barrier arresting system is planned, as well as an emergency barrier. The side-located elevators (lift capacity of 50 tons, and 10 x 12.5 m in size) are situated behind the island. Such a location, in French specialists' view, improves operating conditions during heavy seas and allows setting up of safe anchor (parking) spots for aircraft on the starboard side forward of the superstructure, between the elevators and in the stern, aft of the second elevator.

For defense against weapons of mass destruction, the carrier is equipped with a citadel, or armored compartment where overpressure is maintained. The ship is constructed to optimize its integrity against underwater explosions. The most important sections will have armored protection, and command post in the superstructure will be protected against shrapnel. The crew numbers about 1,700 (including 550 of the airwing). Full speed will not exceed 28 knots, which is slower by 4 knots than CLEMENCEAU. According to the foreign press, increased power of the catapults will permit takeoffs even in the absence of wind over the flight deck.

The ship's armament will include SAAM anti-air missiles in two vertical launchers, emplaced in the forward and after ends of the island and two 6-round launchers for the SADRAL surface-to-air missile (MISTRAL missile with IR homing) on sponsons in the stern on both port and starboard sides.

EW equipment includes the three-dimensional DRBJ 11B radar with its radio-transparent antenna sphere, installed on a lattice foundation in the after edge of the island; DRBV 27 air search radar (forward edge of the island) and a DRBV 15, surface search radar with a masttop antenna; a VAMPIRE infrared detection system; the ARBB-33 jamming transmitter; an ARBR-17 signals intelligence receiving system and a sonar installation linked to a torpedo-launch detection system and a 6-barrel anti-torpedo decoy launcher. It is

intended to include in the EW system SARAI four 10-barrel false target launchers.

All conventional carriers are equipped with a steam power plant, consisting of 4 (2 on CLEMENCEAU) turbine drive assemblies and 6-12 steam boilers, generating steam as follows: pressure, 45-83.4 kg/cm²; temperature, 450-510°C. NIMITZ-Class nuclear carriers have nuclear power plants of four turbine drive assemblies and two water-cooled reactors A4W (eight A2W on the ENTERPRISE) with an active core service life of 13-15 years. RICHELIEU will be equipped with a nuclear power plant, including two turbine drives with combined power of 82,000 hp, and two K150 water-cooled reactors, manufactured in a single block with the steam generators. According to foreign specialists, such a combination of components will have better weight dimension characteristics and will be safer in emergency situations. If circulating pumps are taken out, natural circulation of the heated fluid will ensure operation of the plant at 40 per cent capability.

This description, given above, demonstrates that both the U.S. and France consider aircraft carriers the most powerful and universal components of their fleets and pay continual attention to their improvement.

1. Details of the technical systems for flight operations on aircraft carriers, see FOREIGN MILITARY REVIEW 1982, No 4, pp 66-70.

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NATO JOINT EXERCISE NORTHERN WEDDING-86

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[Article by Capt 1st RANK V. Khomenskiy; "NATO Joint Exercise NORTHERN WEDDING-86"]

[Text] The arms race, perpetuated in the U.S. and other North Atlantic bloc countries that is directed at undermining the economic vitality of the socialist community and at attaining military superiority over them, is being accelerated by intensive operations and combat readiness activities of NATO's joint military forces. Various ways of unleashing armed conflicts are tested during the large exercises which are regularly conducted in the Atlantic and European combat theaters, primarily against the USSR, and techniques are developed for conducting combat operations under conditions closely approximating those in an actual wartime situation. The exercises, held in immediate proximity to Soviet borders and those of other Socialist community states are obviously of a provocative nature intended by their organizers to impress the world with NATO's growing strength, create an air of war mongering hysteria, and convince their people of the necessity of the practical steps taken by the bloc bosses to "extort a buildup" of powerful combat forces and increase their combat readiness against the mythical "Soviet threat." These political objectives were pursued through large joint NATO naval exercises under the code name NORTHERN WEDDING-86, which were held by the bloc from 28 August to 19 September, 1986, within the framework of the AUTUMN FORGE-86 fall maneuvers.

The basic goal of the exercises, as reported by the foreign press, is to test the ability of these nations' navies to organizationally transition from peacetime to wartime conditions, their operational deployment and combat operations in the opening stage of a non-nuclear conventional conflict. The exercise area encompassed the North Atlantic, Norwegian, and North Seas, the English Channel, and a sea-land portion of the Northern European TVD.

The exercise participants included their joint and national naval and air force commands and staffs, NATO's Atlantic strike fleet, the alliance's standing joint Atlantic naval forces and standing joint mine-sweeping forces in the English Channel (which altogether amounts to about 25,000 men), over 150 surface combatants, submarines and auxiliaries (including the U.S. nuclear

powered multi-purpose aircraft carrier CHESTER W. NIMITZ; the amphibious helicopter carrier INCHON; amphibious assault ship SAIPAN; the battleship IOWA, fitted with TOMAHAWK cruise missiles; and the British ASW carrier ARK ROYAL) over 300 combat aircraft and helicopters from the U.S., United Kingdom, Canada, FRG, Denmark, Belgium, the Netherlands, Portugal, and France, and also a contingent of American, British, and Dutch marines.

Overall command of the exercise rested with the NATO Atlantic High Command headed by American Admiral Baggett (headquartered in Norfolk, U.S.A.); the immediate operational commanders were NATO's chief of combined military forces for the Eastern Atlantic and English Channel (located in Portsmouth, England), the strike fleet commander (whose staff was embarked aboard MOUNT WHITNEY), NATO's combined forces commander for northern Norway (in Bodø) and for southern Norway (in Stavanger), and for the Baltic Straits (in Karup, Denmark).

The following missions received attention during the course of this exercise: ASW and ASUW operations against the enemy; amphibious landing operations; defense of SLOCs for convoys and reinforcements from the east coasts of the U.S. and UK to Europe; demonstration of direct air support to ground forces and amphibious landings under beachhead control; defense against amphibious assaults in northern and southern Norway, and the coasts and islands in the Baltic Sea; all sorts of defensive tactics for surface task forces, amphibious task forces and convoys in transit at sea and at anchorages; organizing C3, reconnaissance, and logistical support to ships at sea and in port.

The exercise scenario was predicated upon the provocative assumption that, as heard in the foreign press, the enemy suddenly attacked and seized parts of northern and southern Norway and a series of islands in the Baltic [Danish] Straits, and sortied a large force of surface warships and submarines into the Norwegian and North Seas. The NATO command was compelled by the critical situation that had arisen in northern Norway and the Baltic Straits to transfer U.S., British, and Dutch marine units there as well as reinforce their naval contingent in the eastern Atlantic. Vigorous defensive and offensive operations succeeded in smashing the enemy fleet's furthest advances into the Atlantic and North Sea, destroying the main enemy force in the Norwegian Sea along with their communications in the northeastern Atlantic, blockading the Baltic Straits and providing a continuous flow of troops and military supplies from the U.S. and UK to Europe for perpetuating their offensive combat operations in the continental theater.

The beginning of the exercise was preceded by a preparatory phase (a subordinate exercise called BEST EFFORT), in which a joint NATO naval force in the eastern Atlantic was beefed up with U.S. and Canadian ships. With this purpose in mind, a detachment of amphibious landing ships and transports, with embarked marine units (flagship was the amphibious helicopter carrier INCHON), transited from the U.S. east coast to an area northwest of England over the period 18 to 28 August, operating under the cover of the NIMITZ carrier battle group (CVBG). Approximately another 30 chartered merchant ships were included to carry military cargo and provisions. An ASW task group in the forward area (Norwegian Sea) was reinforced with U.S. SSNs and land-based maritime patrol aircraft forward-deployed in Iceland and northern Norway. A squadron of

F-111D fighter bombers (12 aircraft) and 6 EF-111As was transferred to bases in England. The IOWA surface action group (SAG) augmented the naval missile strike force at the outset of the exercise.

At the start, a NATO Atlantic strike force formed up off the southern Farrier Islands, which included the following groups of U.S. Navy units: The NIMITZ CVBG, IOWA SAG, and an amphibious landing force (amphibious assault ship SAIPAN and amphibious helicopter carrier INCHON) with an embarked detachment of the 4th Marine Brigade; and a British carrier ASW hunter-killer force built around ARK ROYAL.

The striking force's ship and aircraft were tasked with achieving naval supremacy in the Norwegian Sea and covering the amphibious assault forces during their transit to the landing sites along the northern Norwegian coast. The main ASW task group was deployed in the forward ASW area. The carrier hunter-killer task group (APUG) and smaller hunter-killer elements (KPUG), which were comprised of several ships, conducted search and destroy operations against "enemy" submarines that had penetrated through the Norwegian Sea past Iceland into the north and central Atlantic. Land-based maritime patrol aircraft (U.S. and Norwegian ORIONS and British NIMRODS) were employed for coastal ASW duties in the forward areas to operate in close coordination with the APUG and KPUGs.

On 1 September, a 500-man American amphibious force conducted a demonstration landing in the Tromso region of northern Norway. NATO leaders oversaw the landing and ensuing combat operations to seize and expand the beachhead. Their numbers included representatives of the military committee, the supreme NATO Allied Commander in Europe, American General Rogers, U.S. Navy Secretary Lehman, and others who, as emphasized by the Western military press, have a high opinion of the U.S. Marine Corps' capability to conduct offensive operations in arduous mountain terrain.

The amphibious troops re-embarked after the exercise landing in their amphibious landing force (ADS) ships, which proceeded toward southern Norway. They were joined during their transit by an amphibious landing group with a detachment of the British 3rd Marine Brigade (as many as 4,000 men), and a Dutch amphibious combat group (1,000 men) embarked. These British and Dutch marines were loaded aboard the Royal Navy's landing and transport ships in Portsmouth. While this group was forming up in the northern North Sea en route to join the ADS in the landing area in southern Norway, it was protected from the north by the CVBG and SSNs, from the west by ASW forces operating off of Iceland (including the British APUG), and from the south by NATO's standing joint Atlantic naval fleet.

An amphibious landing to establish a beachhead in the vicinity of the town of Larvig (80 km southwest of Oslo) was conducted on 9 September. Its objective was to proceed inland for an offensive aimed at Oslo and, at the same time, occupy a position to protect the captured beachhead. As many as 9,000 U.S., British, and Dutch marines took part in the operation. The amphibious assault, conducted against a fortified landing zone, employed a combination of methods involving the use of landing craft and helicopters. The assault

helicopters were launched from SAIPAN and INCHON to the depth of the territory.

The beachhead was defended by a contingent of Norwegian CHEMVERN infantry and tactical aircraft. American carrier-based aircraft flew missions in direct support of the amphibious forces as they landed and secured the beachhead; marine aircraft and naval gunfire support from flanks of the landing zone to a range of 10 cables (.9 miles) from the beach were also employed. ASW defense for the amphibious objective area and amphibious ship transport holding station was provided by hunter-killer groups of two or three ships each, and by Norwegian Navy mine sweepers and mine hunters.

At the end of the landing operation in southern Norway, the joint naval forces proceeded to blockade the Baltic Straits from the west to prevent "enemy" ships from entering the North Sea and protect the ADS transit to the Jutland Peninsula for an amphibious landing in the Esberg area.

As the foreign press has pointed out, the bloc's high command of the joint NATO naval forces in the eastern Atlantic and Baltic Straits, with the support of tactical air and the wide use of minefields, managed to blockade the "enemy" fleet in the Baltic Sea, and support the second amphibious landing.

About 2,000 U.S. Marines landed on 18 September in the Esberg (Denmark) region and began to conduct offensive combat operations in conjunction with a group of ground forces operating along the coast. The landing was carried out using shipborne landing craft, helicopters, as well as floating piers and ferry boats.

An objective of the exercise was to coordinate the complex application of carrier strike, ASW, amphibious assault and mine warfare forces, and to organize mutually supporting operations between ground and air forces in coastal areas and waters contiguous to the continental TVD.

The main strength of NATO's Atlantic strike fleet was dedicated to protecting the ADS transit from the U.S. east coast into the eastern Atlantic, attaining supremacy in the Norwegian and North Seas, and supporting amphibious landing operations in Norway and the Baltic Straits. Groups of two to eight attack aircraft, each armed with bombs, missiles, and rapid-fire cannon, flew strikes against a group of "enemy" ships.

As in all joint NATO naval exercises, particular attention was devoted to dealing with the enemy's submarine forces, which, according to NATO's brass, represents the most serious threat to NATO's SLOCs in the Atlantic and European theater. An important aspect of the ASW problem is considered to be the timely detection of submarines as they begin to deploy from naval bases in the Atlantic and their destruction within the forward ASW zone. At the same time, the Iceland ASW choke point is considered to be the last point at which submarines can be detected and expeditiously killed with an adequate degree of certainty. Hence, the exercise's heavy emphasis on submarine search and destruction operations at this choke point. To address the ASW problem, surface warships, submarines, and carrier and land-based maritime patrol aircraft operated together as a fully integrated hunter-killer group. As is

usually the case, SOSUS and maritime patrol aircraft played a large role in the primary detection of submarines.

In order to protect the sea lines of communications in the North Sea and the English Channel, ship transits were organized into several convoys. A zone approach was used to provide their ASW and air defense by means of a general set of measures aimed at establishing naval control over shipping and organizing convoy operations. Air cover was furnished by tactical aircraft operating from bases in England, FRG, Denmark, and the Netherlands. The convoys encountered threats from "enemy" submarines, surface action groups, and air strikes, as well as extensive mine fields.

Minesweepers and mine-hunting ships from the British, West German, Danish, Dutch, Norwegian and French navies jointly provided continuous mine countermeasures support to strike and ASW forces operating in the English Channel. Generally, ships left their naval bases and ports only after their egress routes had been swept clear for mines. The amphibious landing operations in southern Norway and Denmark were, especially in their final stages, preceded by control-reconnaissance minesweeping. In areas where there was a high probability of "enemy" minefields, convoys of warships and ships with the highest value cargoes sailed in the wakes of the minesweepers.

Air defense for the various groups of ships, amphibious detachments, and convoys was furnished by direct support forces in close cooperation with NATO's joint European air defense system. NATO AWACS and E-3A early warning aircraft with long-range electronic surveillance systems, based in the Norwegian and North Sea areas, were widely used for early detection of airborne targets and vectoring fighter aircraft onto them. These targets were intercepted before they could bring friendly forces within the maximum range of their weapons.

The exercise scenario also included reconnaissance operations, control of heterogeneous forces and cooperation between different types of military forces, and logistic support of ships at sea and naval bases. Within the battle group formations, fuel and munitions were transferred from tankers and replenishment ships to the ships of the striking force, usually by underway replenishment or vertical (helicopter) replenishment techniques. Electronic warfare operations were vigorously practiced, especially during the amphibious landings.

Judging from comments made by foreign military experts, NORTHERN WEDDING-86 mainly focused on: broadening the area of operations, advancing the idea of operating a missile battle group (the battleship IOWA with her TOMAHAWK cruise missiles) in the Norwegian Sea, and a trend toward further integration of the Royal Navy's ships and aircraft into the exercise when compared to similar ones in past years.

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FRENCH NAVY SHIPBOARD ELECTRONIC WARFARE SYSTEMS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 66-70

[Article by Capt 2nd Rank (Reserve) F. Voroytskiy and Capt Lt N. Portala; "French Navy Shipboard Electronic Warfare Systems"]

[Text] At the present time, France is one of the leading capitalist countries in the world market of shipboard electronic warfare systems. Notwithstanding the fact that France is not an official member of NATO's military organization, in this area, her industry works very closely with firms in the U.S., Britain, Germany, and other countries who are members of the aggressive North Atlantic Pact.

The foreign press pays much attention to the structure, characteristics and means of applying shipboard EW systems by the French Navy. It points out, above all, the complex character of the use of EW jointly with anti-air missiles and anti-ship missile systems, their carriers, working toward joint application of all shipboard systems of surveillance for simultaneous detection of the threat and coordinated command control, as well as the use of multiple means of establishing interference and fire. Various combat scenarios are conceptualized, along with the enemy orders of battle, tactical systems for use of technical means and fire power, their characteristics, etc.

In the foreign press, it is reported that modular construction of EW systems allows the establishment of universal variants of installations for ships of various classes, substantive simplification of repair and modernization as well as compatibility with other ship systems. Finally, a good deal of attention is paid to the technical characteristics of these systems, their orientation toward achieving a high effectiveness in detection and counteracting modern (in capability and perspective) firepower, and its control systems.

Western specialists divide shipboard EW systems according to functional designation into the following groups: SIGINT systems (RTR), and radar warning systems, active interference stations (SAP), as well as passive radar stations, infrared and combination interference.

RTR and radar warning systems DR3012, TMV433, TMV434, TMV026, TMV012 and ELISA. These are designed to detect radar signals and measure their parameters: modulation type, pulse length and pulse repetition frequency, antenna rotation rate, including the bearing of the source of the beam. These stations are constructed basically on one principle, they are relatively small in size and weight, which permits use on light displacement ships, submarines and helicopters.

The DR3012 includes two antennas (omnidirectional, for receipt of the signals, and directional, for determination of the signal source direction), a search receiver, an ARIAL signal analyser and an automatic system signaling the receipt of an enemy radar signal. ARIAL compares an incoming radar signal with a standard, residing in a memory bank, determines the type of radar and displays it on a screen, while alerting the operator of the enemy radar with visual and audio alarms.

TMV433 and 434. Their main component is the DR2000 receiving system and the DAHLIA and ARIAL signal analyzers.

The various complexes include operating with interference laying systems as well as with any kind of shipboard fire control systems or situation display systems with digital command.

The DR2000 wideband receiver (working frequency 1-20 GHz) is an omnidirectional receiver. It includes an omni and six directional channels with detected receivers with "instantaneous frequency measurement," an automatic signal analysis subsystem, operating in subblocks of frequencies of 1.55-5.2, 3.9-6.2, 5.2-10.9 and 12.5-18.0 GHz, a signal processing and display subsystem and a control panel. The receiver is interoperable with other RTR stations, signal analysers, active interference stations and passive jamming systems, etc.

The DR2000 is expected to be replaced by the more modern DR4000 (0.5 to 40 GHz), which has three modifications: DR4000S for surface ships, DR4000V for submarines and DR4000A for aircraft. Each of them is constructed and electrically compatible with the respective variants of the onboard equipment, which substantively simplifies and lowers the cost of its installation and use on various platforms. To assure omnidirectional reception with a high probability of detection of even single pulses, the system uses a detected receiver with "instantaneous frequency measurement." This relates to the omni channels as well as the directional ones. The foreign press emphasizes the capability of the receiver group to segregate and analyze all radar signal parameters even in very complex electromagnetic situations.

The antenna group consists of one omnidirectional antenna and two blocks each with six directional antennas in the frequency bands of 6-29 and 0.5-6 GHz.

The operator's panel includes two racks of signal processing equipment, connected to a CRT display and to control systems, including active and passive jamming systems.

The DR4000 receiver, with the aid of a special computer, can distinguish the characteristics of missile warhead guidance systems and fire control radars, as well as radio signals on the platforms. Up to 10 signal parameters are analyzed, which permits immediate target identification.

The EW situation is displayed in polar coordinates on a lighted screen in both analog and digital formats. A symbol of a designated configuration shows the type of platform detected by the radar and the results of its IFF interrogation. Various degrees of threat are displayed in three-colored code. When necessary, the operator can bring up on the screen in an alpha-numeric format all data characterizing any incoming signal together with the results of his analysis and identification. The graph display also contains all information on the SAP mode of operation and ways to set up passive interference. The display quality is especially important for ships where the number of operator panels and operators is limited.

The DAHLIA signal analyzer, according to the foreign press, very accurately analyzes and identifies working radars and can be programmed to detect specified radar types, for example, those operating in an automatic target tracking mode, missile homing radars and intermittent and short-duration radars. All high frequency radar signals received by the DR2000 are automatically analyzed, and their parameters compared with those in the analyzer's memory bank, containing 1,000 (DAHLIA-1,000) or 500 (DAHLIA-500) entries of typed radar parameters. The ARIAL stores 15 sets of radar parameters. The results of this comparison are displayed on a CRT. If the pre-stored signal parameters correlate with several radars, the system displays a degree of probability of each correlation. The results of the analyzer's operations can be printed out in an alpha-numeric form on magnetic tape, perforated tape, or transferred to a tactical information-processing system. The DAHLIA and ARIAL analyzers weigh 33 and 30 kg respectively.

As the foreign press stresses, from 1980 until today, about 170 TMV433 sets have been produced, equipping ships of 25 countries, including NATO.

The TMV026 SIGINT system is installed in helicopters and aircraft. It comprises one omni and six directional antennas, the DR2000 receiver and the DAHLIA-500 analyzer. TMV026 sensitivity is about -45dBm.

The TMV012 SIGINT system and the ELIZA, with increased sensitivity, ensures search and analysis of continuous pulse radar emissions. They can be installed in ships, aircraft and ground installations.

ELIZA is compatible with the DR4000 and can be used with it in an installation for enhancing the probability of signal detection and accuracy of classifying it. If necessary, its frequency band (0.5 - 20 GHz) can be widened or decreased and simultaneously the controlling band width can be changed from 500 MHz to "very limited value." Microprocessors automatically control reception and analysis. Incoming data is displayed on a flashing screen in analog (as part of an overall display of the electromagnetic situation) or digital format (for display of emission analysis, including a histogram of the emitter and spectral characteristics of the signals).

The active jamming station JANET, of the Thompson-CSF Company, creates disinformation (response-pulse) and noise jamming of enemy radar in the 8-20 GHz frequency band. It works in a combined noise and response-pulse mode emitting jamming "by a disinformation complex" or responsive noise jamming.

JANET can simultaneously counteract two threat emitters, separated in space, each of which comprises several transmitters, operating in adjacent frequency bands and directions, it can give accurate bearings on other shipboard systems, among other things, to the combat information center. It is controlled automatically, has a short reaction time, including a rapid selection of the type of interference (jamming) for various targets, and can simultaneously operate against several targets separate in space and frequency.

The system contains four autonomous jamming modules (some foreign sources report only two), each of which is a separate autonomous SAP. Each module includes a receiver with "instantaneous frequency changing" and twin-horn antenna, ensuring target azimuth determination and auto-tracking, noise transmitters and response-pulse jamming, and the power amplification of a travelling wave type. Overall module weight is 250 kg.

Built-in microprocessors control signal identification of incoming signals both from the receivers and the SIGINT systems with connected SAPs, turns on the jamming transmitter in the desired mode, and transmits this information to the SIGINT station and to other shipboard systems. The foreign press notes the high degree of isolation between the receiving and transmitting channels of the JANET system, allowing their simultaneous operation. Thanks to this, specifically, it is possible to suppress effectively a pulsed radar with flexible retuning of the carrier pulse frequency, because it cannot be done while operating in the target tracking mode in the short operating intervals of the SAP transmitter.

Means of establishing passive anti-radar, infrared and combined jamming in the French Navy have been designed and installed principally by the firm of CSEE, which, in foreign specialists' view, is now the largest producer of these systems in the world. It builds and sells the DAGAI system in 13 countries (for equipping of medium displacement ships), a simpler variation MAGAI (small ships) as well as SAGAI for medium and large ships). Their characteristics are displayed in the table.

DAGAI and MAGAI systems are similar in their method of military application and very close to each other technically. They are designated for laying down chaff interference against antiship missiles in the immediate vicinity of the defended ship(1).

The necessary jamming effectiveness in this mode is attained, according to foreign experts, in that situation when the direction and strength of the wind, as well as the ship speed, is very accurately known, so that the drift of the cloud of dipole reflectors or IR decoys takes place in a zone of safety for the ship. It is considered that the smallest dimension for a miss by a missile must be about 100 m. If less, then the control system for the jamming

gives out a new course for the ship, increasing the miss probability of the missile up to the given size.

TACTICAL-TECHNICAL CHARACTERISTICS OF FRENCH NAVY SHIPBOARD PASSIVE JAMMING INSTALLATIONS

System Name	Type Jamming	Launcher wgt, kg less Rockets With Rockets	Launcher hgt, mm No. of Cassettes	Launcher Turning Circle, mm Max Angle of Trawl, Degrees	Cassette Dimensions, mm (Head x Diam x Length)	No. of Jamming Carriers in a Cassette Dipoles Infrared	Fuse Time (Effective Operating Time), sec Range, km	Installed on
DAGAI	IR, Chaff Decey	<u>500</u> 1,000	<u>1,200</u> 10	<u>1,000</u> 330	630 x 735 x 130	<u>33 x 4</u> 34 x 2	<u>5 (30)</u> 0.1	Main Ship Classes
DAGAI	Same	<u>400</u> 600	<u>1,200</u> 3	<u>400</u> 330	---	<u>23 x 4</u> 23 x -	<u>5 (30)</u> 0.1	Cutters and Small Ships
DAGAI	IR Chaff Secoy, Deception	<u>1,000</u> --	<u>2,000</u> 10	<u>1,600</u> 360	(170 x 1,740)	<u>54</u> 7 x 2	<u>Up to 12 (30)</u> Up to 5	Main Ship Classes

Additionally, system designers learned this: in order to retarget the radar homing of a missile onto a false target, it is necessary that the effective surface distribution of the dipole reflectors exceed the effective surface distribution of the protected ship, and the size of its horizontal cross section ought to be about 15 m. To counter IR homing, the main part of the false target radiation must be in the area of 8-15 and 3-5 microns, corresponding to the radiation of the ship's hull and stack gases, while the intensity is commensurate with the strength of the ship's radiation. Also, an infrared false target must be placed at an altitude where it can counter anti-ship missiles which fly at various trajectories. Spatially it must be collocated with the radar false target, to have an effective operating time of about 30 seconds and must emulate the dimensions of a ship, which is considerably larger than the IR radiation source.

To counter several anti-ship missiles, the control system optimizes the parameters of the chaff, which are put up sequentially following rotation of the launcher at respective angles. It is noted that in nine seconds, chaff can be put up to defend a ship from attack from three widely dispersed directions.

The DAGAI launcher has 10 cassettes, filled with rounds of dipole reflectors or IR decoys. Each round has a pre-set angle of elevation in the area from 15-80°, guaranteeing the necessary dispersal of chaff in space. Each cassette can be shot out in 0.5 seconds.

In one variant of the dipole reflector complex, there are 33 rounds, each carrying 4 fully loaded rockets, assuring 132 points for firing chaff

reflectors into a given volume of space. The launch facilities aimed at the most distant points are loaded first. This permits the virtually simultaneous establishment of a dipole reflector cloud with a high ceiling of about 100 m and a low of 20 m above the surface, 150 m thick and a center of gravity of 30 m. From the moment of launching the first pack of dipoles to the last, it takes about one second to establish the cloud after the rocket launching. The overall time to establish the chaff after threat detection to the commencement of effective action does not exceed 5 seconds. No more than 200 microseconds are required to achieve a firing solution.

There are 34 four rockets which contain IR decoy cassettes. At the outset, a volley of eight rockets is fired, which comprises a group false target with a 5-second radiation time. The next 26 rockets are fired in various directions into the air where, supported by parachutes which open on given delay, they fall into the sea, become an IR source through burning of a pyrotechnic round from one of the segments of the payload. They fall into the water after six seconds at 1-second intervals. When they hit the water, explosions from the rocket throw IR pyro-shards up to an altitude of 15 m, where they ignite and burn for another 2 seconds. Radiation time for an IR decoy is no less than 30 seconds, while the overall operational time of an IR decoy is 30 seconds.

The launch system has a maximum train angle of 330° and can be trained 90° in less than 2 seconds. Targeting accuracy is under 3° , and one typical cassette round weighs about 45 kg. A computer is also built into the system, a command and indications system, a display of recommended maneuvering in conditions of jamming and a test subsystem. Control of the establishment of jamming is done automatically according to data from the SIGINT station.

Ships of 800-5,000 tons are equipped with the DAGAI system. They have two launchers (one on each side). According to the foreign press, this system can be installed on small as well as large vessels. In the former case, there is only one launcher, in the latter, two are installed. This system is in the inventory of the GEORGES LEGUEY-Class DDGs, D'ESTAING D'ORVE-Class FFG and the COMMANDANT RIVIERE (in all, 30 ships), as well as the Project MEKO 360 DDGs and PROJECT MEKO 140 FFGs of the Argentine Navy and for other countries.

The MAGAI system is more compact and simplified for installation in patrol cutters and those medium size ships where a shortage of useable space prevents installation of larger size systems. Its launcher contains three interchangeable cassettes armed with 23 rockets with dipole reflectors or IR decoys. Each has 4 rounds of dipole reflectors which gives a total of 92 rounds per volley, forming a cloud with an effective surface distribution of about $3,000 \text{ m}^2$, which, according to foreign specialists, is effective in the frequency range from 6-20 GHz. IR radiation sources have a spectral strength of 2 KW/steradian x micron in the area of 3-5 microns.

The SAGAI system is prescribed for installation on all main ship classes. In the absence of other systems listed above, this is designed to put up disinformative false targets, to counter enemy radar during the search and target selection stage, and to counter anti-ship missiles before target acquisition when its homing is on auto tracking. The system can be used jointly with a SAP. The foreign press has remarked on the potential

variations of such use: it can set up a deceptive false target simultaneously with active deceptive jamming, making target selection difficult; it can set up a false target jointly with active jamming, guaranteeing retargeting of radar homing to the false target after the jamming has ceased; and it can set up a false target under cover of active masking (noise) jamming, permitting seizure of the radar homing by the false target after active masking jamming has terminated.

The SAGAI system includes: one or two launchers, 1-2 control groups, a computer, command post with indicators and a system tying it to the ship's combat information center.

The launcher assemblies are stabilized and trainable in azimuth and elevation. The chaff rockets are located on the launchers in waterproof transport-launch containers. Each rocket weighs 40 kg, the container - 30 kg, and the payload (dipoles or IR decoys) - 20 kg. It is equipped with a 2-stage engine, delivering and maintaining a speed of 250 m/sec in 20 seconds. A rocket, armed with dipole reflectors has 54 shooting devices, which form a disc-shaped cloud perpendicular to the direction of the enemy threat, and those equipped with IR decoys have 7 such devices, situated lengthwise. Upon reaching the point of establishing the false targets, the propulsion section separates and the rocket, with its parachute, falls to the water, following which an explosive charge goes off, shooting all 7 false targets aloft. They fall on parachutes which do not open simultaneously, and the descent proceeds at intervals, increasing the false-target operational time. Upon landing, the pyrotechnic round makes a large fountain up to 10-15 m high, which also increases the operational activity of the jamming. IR and anti-radar jamming are put into place with consideration of their joint action as a combined false target. The French DDG KASSAR is the first ship for installation and test of this system.

Based on design of various EW systems, the firms Thompson-CSF, ESD and CSEE have designed and produced shipboard EW complexes NEVCI and SAPIENCE.

The NEVCI shipboard EW system includes an ARBR-17 SIGINT system (with the newer DR4000), an ARBB-33 active jammer (replacing JANET), two DAGAI launchers and two SARAI launchers, linked to a single command post. The launcher contains two processors; for EW data processing and for control of the chaff installation. Operation is automatic. The EW officer at the command post only controls its operation, which is aimed at simultaneous tracking of several targets, working out solutions, and issuing orders to launch various types of jamming, taking into account threat priority, and organizing the extent of counteraction and optimization of the variants of counteraction, as well as the mutual disposition of neighboring ships in order to reduce to a minimum the negative effect of jamming (for example, a hit by an anti-ship missile on a neighboring ship, as happened in the Anglo-Argentine war on the container ship ATLANTIC CONVEYER. The complex is linked with the ship's combat information center.

The SAPIENCE EW system is the export variant of the NEVCI. It is said that it operates in a wide range of frequencies, and it is planned to increase its range to millimeters.

According to the Western press, French firms have established wide contacts with firms in the U.S., Great Britain, and other NATO countries, and jointly design and test new technology, as well as sell licenses on systems of anti-radar, IR and combined jammers.

1. For details on this, see: ZARUBEZHNOYE VOENNOYE OBOZRENIYE, No 6, 1980, pp. 72-73.

2. Note: the lead ship of four being built in series. They are similar in type to the DDG GEORGES LEGUES, but have increased anti-air armament.

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AUSTRIAN MILITARY PRODUCTION

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 71-77

[Article by M. Leontyev; "Austrian Military Production"]

[Text] Recently, the aggressive NATO bloc has been increasing military preparations in Europe substantially. At the same time, its leadership figures are paying all the more attention to their strategic plans for neutral European countries. By using military-political and economic pressure, they are trying to draw these countries into the arms race and to subordinate their economies to their aggressive plans. All this is true of Austria.

After the liberation of Austria in 1945, from the Hitlerite hordes (from 1938 it was annexed to Germany), the country was divided into four zones: Soviet, U.S., British and French. In May 1955, representatives from the USSR, the U.S., Great Britain and France signed the State Treaty reestablishing Austria's independence. According to this document, the division of the country was put to an end and, in October, 1955, the Austrian parliament adopted the neutrality law. The State treaty imposes specific limitations not only on the number of personnel and the equipping of Austria's armed forces, but also on the production of individual types of weapons and military equipment.

In adhering to a policy of neutrality, the country's military-political leadership considers it to be important to maintain the country's defensive capability at a high level. The government's unfolding "defensive concept" is reflected in the so-called "General Defense Plan," adopted in 1983. One of the main emphasis in the document is on the all-around strengthening of the Austrian armed forces by equipping them with an entire complex of armament necessary to carry out the missions assigned to them. Although the issue regarding the development of their own military-industrial base is not addressed specifically in the plan, the problem is raised of the necessity to equip the army with weapons it produces.

Austria allocates significant financial resources for the development of the armed forces. The Ministry of Defense's yearly budget has already overstepped the 3.5 per cent limit of the general government expenditures. The absolute measure of the expenditures for military purposes (based entirely on the

ministry of defense entry) grew from 4.0 billion shillings in 1970, to 18.8 billion in 1986 (which was 0.1 and 1.2 per cent of the gross national product, respectively).

In comparison with many leading capitalistic countries, Austria does not have a developed and organizationally complex military industry at its disposal. However, the interest of local firms in this area of production is continually growing. Currently, more than 50 enterprises from various branches of industry are engaged in the production of weapons and military equipment. According to foreign specialists' estimates, the military production turnover of Austria's industry significantly exceeds 10 billion shillings a year. Purely military enterprises do not exist in the country. A limited internal market has resulted in the fact that 85 per cent of the military industrial products are exported to almost 40 countries in the world. The requirements of the Austrian armed forces for light tanks, BTRs, artillery fire armament, ammunition, and engineering, radioelectronic and optical equipment is met through its own production. The country's production capacity to produce armament can be significantly increased if necessary in a short time.

The production of weapons has developed based on extensive experience accumulated in the previous period. Large military enterprises existed in Austria even prior to the First World War. Fascist Germany actively utilized its industrial potential. For example, according to several Western press estimates, up to 10 per cent of German aircraft, a large number of armored equipment and gun fire weapons were manufactured on Austrian territory. During the war, a large part of the military enterprises were destroyed by allied air force bombers of the Atlantic coalition. The remaining enterprises were dismantled later or transitioned to produce civilian goods. However, by the beginning of the 1950s, the firm Steyr Werke turned to the production of army trucks and expanded the production of gun fire weapons. The company, Hirttenberger Patronen-Zuendhuetchen und Metallwaren-Fabrik increased the delivery of various ammunition to the international market.

Great capabilities to increase the output of armament was given to Austrian firms after the 1955 State Treaty was signed and a law adopted creating a permanent armed forces (up until this time, only a paramilitary gendarmerie existed in this country).

The country's neutral status, the small number of armed forces, and also the limitations imposed by the State Treaty were the main barriers to the expansion of military production. Because of the small opportunities in the internal market, the characteristic feature of the Austrian military industry was its high export trend. According to foreign specialists' assessments, more than 80 per cent of the weapons and military equipment produced in the country is delivered abroad. Austria holds the seventh place in the capitalist world in the export of armaments. The main purchasers are the developing countries of Latin America, Africa, and the Near East.

The turning point in the development of weapons and military equipment production was the economic crises of the 1970s. Namely, during this period Austrian firms, seeking opportunities to obtain continuous and very high profits, actively engaged in military production. The connection of the large

government concern, Fest Alpine, to the production of weapons was an indicator of this.

Currently, the 4th Main Directorate of the Ministry of Defense, and within it, the Central Directorate of Military Production through which orders are placed, is the central organ coordinating the activities of military-industrial firms supporting the armed forces. This same department coordinates RTD&E in the realm of military production. For the most part, all RTD&E is completely carried out by contractors, and the finishing and prototypes tests are carried out at firing ranges belonging to the armed forces.

According to foreign specialists' assessments, to a large extent, the country's existing military production industrial base meets the requirements of its own armed forces for specific types of weapons and equipment. However, a significant number of them are purchased abroad. The largest armament suppliers are the U.S., Sweden, the Netherlands and Switzerland, which supplies the Austrian armed forces with the Pilatus aircraft and also fire control systems, automatic cannons and radio equipment. Italy occupies a prominent role, exporting helicopters and ammunition to Austria. Belgium, Norway and Sweden also supply the latter. Tanks and automatic antiaircraft guns are purchased in France. The United States sells electronic equipment. In 1985, an agreement with the Swedish firm Saab-Scania was signed for the acquisition of 24 SAAB-35D DRAKEN fighter-interceptors. The deal was concluded for a sum exceeding 5 billion shillings (120 million dollars).

THE AVIATION INDUSTRY is practically non-existent in Austria. The aircraft fleet is equipped with foreign-produced aircraft. However, Austrian firms cooperate internationally in the production of aviation equipment. The leading firm in this area is Vereinigte Edelstahlwerke (VEW), a branch company of the concern, Fest Alpine, with enterprises in the cities of Kapfenberg, Ternitz, and Murzzuschlag) which maintains cooperative connections with large aircraft construction concerns of Western Europe such as Messerschmitt-Bolkow-Blohm (MBB) and Dornier (both the FRG), Aeritalia (Italy), and also engine manufacturing firms such as Motoren- und Turbinen-Union (MTU, FRG), Pratt and Whitney (U.S.), Rolls-Royce (Great Britain), and others.

Aluminum and titanium alloy casting is VEW's specialty item. The firm has accumulated a great deal of experience in producing it. The product is primarily in the structural elements of aircraft airframes and engines. Parts and assemblies manufactured at Austrian plants are used in the BO-105 and BK-117 (FRG) helicopters, the Agusta firm helicopters (Italy), in A300 and A310 wide-bodied transport aircraft, and also in the production of tactical fighters such as the VIGGEN (Sweden), the AMX (jointly produced by Italy and Brazil), and others. Additionally, Austrian castings are used for the production of engines manufactured by the companies of Pratt and Whitney, Rolls-Royce and MTU.

A large number of Austrian-made URLAUND (produced under British license) and SEA STALLION (American) helicopters have been exported, in particular to Israel and Norway.

The production of armored equipment created on the basis of vehicle construction is the most extensively developed in Austria. The armor industry produces the SK105 JAGDPANZER tanks (Kuerassier) and SAUER armoured personnel carriers, and also other combat and engineering equipment based on them. Twenty five to thirty (25-30) per cent of the equipment produced is exported to Latin American countries.

More than ten government and private machine building factories comprise the industrial base. The firm Steyr-Diamler-Puch (in Vienna) is the main producer. It includes three assembly plants which produce tracked and wheeled armored vehicles and also cross-country vehicles. These enterprises are located in Vienna, Steyr and Graz. The firm also produces various modifications of armored personnel carriers, the KUERASSIER light tank, and the GREIF BRDM for the country's armed forces and also for export. The factories of the firms "Sauer-Zimmering" and "Greif und Stift" also produce armored equipment. Almost all the vehicle assembly plants of these firms have a reserve capacity to produce military equipment.

The first types of armored personnel carriers were developed in 1956. The experience obtained during series production provided the capability to begin the construction of a new generation of armored vehicles during the second half of the 1960s. The KUERASSIER light tank, the prototype of which was assembled in 1967, was the first of these. The series vehicles began to be delivered to Austrian troops in 1970. Tank armament consists of a French-made smooth-barrelled cannon (CN-105-27) and a 7.62-mm machine gun. The cannon is installed in the turret of the AMX-13 French tank, manufactured under license. Casting and rolling for the KUERASSIER tank is made by an integrated iron and steel works in Linz (the concern of Fest Alpine) at the firm's assembly plant in Vienna. At the end of the 1970s, the concern produced the modernized version of the tank, the KUERASSIER-2. This variant was equipped with a weapons stabilization system, automatic fire control system and night vision instruments. In all, by 1986 more than 600 tanks had been produced. The yearly output is 40-50 tanks. The high performance characteristics for this vehicle class and the comparative low cost provides the KUERASSIER with a wide market abroad, including in Peru, Bolivia, Argentina, and Mauritania. Since the beginning of series production, more than 200 tanks have been exported. In 1985, an agreement was signed for the sale of 100 tanks to Iran and negotiations on the delivery of 200-300 vehicles to Saudi Arabia are being carried out.

Information has appeared in the foreign press on the continuing development of a medium tank in Austria, intended to replace the American-produced M47 and M60 existing in the army's armament. the scientific-production base developed within the country will permit the output of tanks with high performance characteristics and meeting modern requirements.

The SAUER family of armoured personnel carriers by the firm Steyr-Diamler-Puch, manufactured since the middle of the 1970s, under the general index number, 4K4F, includes the following modifications: a strict armored personnel carrier, a command vehicle, a combat reconnaissance vehicle and also an artillery gun layer and an ambulance. In 1976, a new BTR was manufactured with an index number 4KF7. The experience in developing the KUERASSIER tank was

taken into consideration in its development. It served as the base model for series production of the combat vehicles. In particular, the series BTR is armed with a 12.7-mm machine gun (accommodated on a rotating turret) and the MG-42 (or the MG-74) 7.62-mm machine gun. The crew consists of a commander, a mechanic-driver, and there is a capacity for eight assault personnel. Besides a machine gun, a Swiss-produced 20-mm cannon is mounted on individual BTRs and the French-made 20-mm or 30-mm caliber twin antiaircraft mounting (in the turret) and a radar are also installed on some vehicles.

According to foreign press reports, the PANDUR wheeled armored personnel carrier is being developed by the firm and is intended both for the Austrian army and for export (its series production was planned to begin in 1986). Its variants will have various types of armament; a 12.7-mm machine gun, a 20-mm automatic antiaircraft cannon, an 81-mm mortar and a 90-mm recoilless weapon. The vehicle was designed to transport 12 men (including two crew members). The BTR will be capable of overcoming water obstacles without preliminary preparation.

The production of the GREIF BRDM and an engineer tank, using a tracked undercarriage, is being finalized at a factory in Vienna for equipping the engineer troops.

Besides combat equipment, large capacity cargo vehicles (up to 10 tons) and the PANZGAUER army 4-wheel drive vehicle is being produced at the firm's factories in the cities of Steyr and Graz. In all, since 1971, more than 20,000 4-wheel drive vehicles have been produced and delivered to the armed forces of Austria, Switzerland, and a number of other countries. The yearly production is assessed to be 1,500 vehicles. From 1958 to 1974, the firm produced the HAFLINGER 4-wheel drive vehicle. The total number of vehicles produced was 16,700. In 1985, the PANZGUAER-Turbo D 4-wheel drive vehicle equipped with a diesel engine was assembled at a factory in Graz. In developing a cooperative connection, the company Steyr-Daimler-Puch jointly with the firm Daimler Benz (the FRG) developed the PUCH-G 4-wheel drive vehicle. The first series model was assembled in February, 1979.

The firm Oesterreichische Auto Fabrik (Vienna), belonging to the West German concern MAN, also produces 4-wheel drive cargo and loading vehicles for the Austrian army. The company's most well-known product is the JUMBO six-axle prime mover with a 400 hp MAN engine. Additionally, double and tripple axle wheeled armoured personnel carriers, on which 35-mm cannons produced by the Swiss firm Oerlikon-Burle are installed, are assembled at the plant primarily for export.

The firms Noricum Maschinenbau und Handel, Vereinigte Edelstahlwerke, Hirtenberger, Ennstaler (comprising the concern Fest Alpine), Steyr-Daimler-Puch, Glock, and Bure are engaged in the PRODUCTION OF ARTILLERY FIRE WEAPONS.

Fest Alpine concern's beginning of military production began in 1979, with the acquisition of a license in Canada to produce a 155-mm towed howitzer. Its series production (the designation GHN-45) began in September, 1981. The howitzer is assembled at a factory in Leizen, belonging to a branch enterprise of the concern, the firm Noricum. According to Western press information, up

to 10 artillery systems are assembled per month at the factory. The production of these howitzers is completely oriented toward export, since Austria is forbidden to have artillery systems in its armament with firing ranges of more than 30 km. Besides a towed howitzer, a self-propelled howitzer variant is also being developed. Information on the completion of the firms order for these howitzers from Jordan and Thailand and on the receipt of orders from India and Malaysia has appeared in the foreign press. One hundred and five millimeter (105-mm) cannons are being delivered to Tunisia (under British license). A 105-mm anti-tank self-propelled cannon is being developed in Austria on its basis.

According to foreign press testimony, mortars produced by the Noricum firm are high in demand. The production program includes 60-, 81- and 120-mm caliber mortars. Part of the 81-mm and 120-mm mortars are mounted on armored personnel carriers made by the Steyr-Daimler-Puch company.

Austrian industry almost completely provides the requirement of its armed forces for fire weapons. The firms Steyr-Daimler-Puch, Glock, and Bure engage in the production of these weapons. The nomenclature of the Steyr-Daimler-Puch firm products includes combat weapons and also hunting and sport weapons, assembled at the firm's main enterprise in Steyr. One of the best known weapons developed by them is the StG77 5.56-mm automatic rifle (STURMGEGWEHR-77, known abroad as the AUG for the English Army Universal Gun). Austria's armed forces are equipped with it, and a large number are exported to Malaysia, Tunisia, Oman, and Cameroon. The firm is also considering obtaining a contract for the delivery of 2,500 rifles for the U.S. Army. A license was granted for the production of 67,000 of these rifles in Austria. Additionally, the firm produces the MG-74 light machine gun (a modernized variant of the MG-42 machine gun), the MP69 and MP81 automatics, and the 9-mm caliber PARABELLUM pistol (since 1981).

The Glock firm (in Deutsch-Wagram) makes a 9-mm caliber pistol with a 17 round cartridge, which foreign specialists highly evaluate. The Austrian army has ordered 25,000 of them.

The light machine gun made by the firm Bure (in Kufstein) is being added to the armament of the country's army and exported. Its serial production began in 1979. The machine gun has a disc magazine of 177 small-caliber rounds and a maximum firing rate of 1,700 rounds per minute.

The Austrian armed forces' requirements for all types of AMMUNITION AND EXPLOSIVES is satisfied by its own industry.

The largest producer of ammunition is the firm Hirtenberger Patronen Zuendhuetchen Und Metallwaren-Fabrik (in Hirtenberg). The firm's factory produces a wide assortment of ammunition, from hunting to artillery ammunition, and also 81- and 120-mm caliber mines. The yearly output of cartridges exceeds 100 million pieces, of which 80 per cent are exported.

The largest deliverer of explosives is Dynamit Nobel Wien (Vienna). The firm also produces detonators, anti-tank and anti-infantry mines, training hand grenades, and illuminating and smoke devices.

Besides the mentioned firms, the following companies manufacture ammunition; Ennstaler Metallwerke Leizen (tungsten alloy armor piercing core charges); Suedsteirische Metallindustrie, Leibnitz (artillery and rifle ammunition, antitank mines, hand grenades); Semperit in Vienna (detonators, parts for hand grenades).

Austrian shipbuilding is represented by two shipyards of the company Oesterreichische Schiffswerke, Linz-Kornenburg, which is part of the Fest Alpine concern. These enterprises are located at Linz and Kornenburg. Patrol cutters, pontoons and pontoon bridges are built at the shipyards for the country's armed forces and for a limited defense. Plastics and aluminum alloys are used extensively in the production. This firm is well-known for its river cargo and passenger ships and floating cranes.

The radioelectronics industry has undergone substantial development in Austria due to the influence of scientific-technical progress. According to foreign reviewers' opinions, its comparative high technological dependence on foreign firms, especially on American and West German firms, is this industry's weakest area. The branch enterprises deliver various radioelectronic measurement and optical products. The country produces radios; field telephones; weather observation systems; laser, infrared and optical rangefinders; sights, binoculars, periscopes; and various control measurement devices. The firms Svarovski Optik, Siemens Oesterreich, ITT Austria, Eilen Union, Shrack and Hannsmann Diesel Elektro (all in Vienna) are the main suppliers of these products.

Many firms produce clothing and equipment for the Austrian Army and for export, including Ariedo Bekleidungswerke (Vienna), Karl Hut and Muetzen (Eigg), Einder (Vienna), V. Kehalle (Bad Bazlau), Z. Kitzmantel Schufabrik (Folk Dorf) and others.

According to Western Press assessments, Austria's military industry continues to develop at a rapid pace. The types of weapons and military equipment which it produces meets modern requirements and its high quality is bringing it a large market abroad. The sphere of interest of Austria's military industrial firms is not only limited to export sales. Cooperative connections in armament production are being developed actively. Besides the mentioned collaboration in the production of aviation equipment, the Fest Alpine concern delivers, for example, armored sheet metal for the production of LEOPARD tanks in the FRG. Additionally, one of the leading Austrian weapons producers, the firm Steyr-Daimler-Puch organizes the production of military equipment directly in foreign countries. For example, its filial enterprises in Salonika (Greece) and Bauchi (Nigeria) produce armored personnel carriers under Austrian license.

Austrian firms must consider specific limitations contained in Austrian legislation in its production activities, both within the country and abroad. Nevertheless, they consider military production to be one of the profitable realms for capital application.

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ALASKA (A MILITARY-GEOGRAPHICAL DESCRIPTION)

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 77-82

[Article by Maj N. Shakhovtseb; "Alaska (A military-Geographical Description)"]

[Text] The U.S. political-military leadership views Alaska as an outpost on the edge of the Northwest American continent, whose significance is determined by the favorable military-geographical situation of the state which is in direct proximity to the eastern borders of the Soviet Union. Important intercontinental air and sea transport routes, linking North America with the countries of the Far East, Southeast Asia and Europe, transit across Alaska. In addition, the state is equally remote from the majority of regions in which the heaviest administrative-industrial centers of the Northern hemisphere are concentrated. Considering all this, U.S. military strategy long dubbed Alaska the "center of the earth." It is not happenstance that the utilization and economic development of Alaska, in the 20th century, has been linked, in the most intimate way, primarily with satisfying U.S. military requirements. And now the regions quickening economic development is explained, in part, by the drive by the ruling circles to prepare its territory as a desirable staging area for realization of its aggressive plans, as well as to increase its investment value in increasing U.S. military-economic potential.

The main economic activity in Alaska, before the discovery and exploitation of the then vast oil deposits, was generated by defense budget resources and was mainly concentrated in maintaining and developing an infrastructure vitally important to the steady material support and maintenance of troops in a state of combat readiness. And now, despite the rapid population growth of Alaska, a considerable part of it, as before, is involved with serving the armed forces. Two of every three men over 19 are directly or tangentially involved with the armed forces.

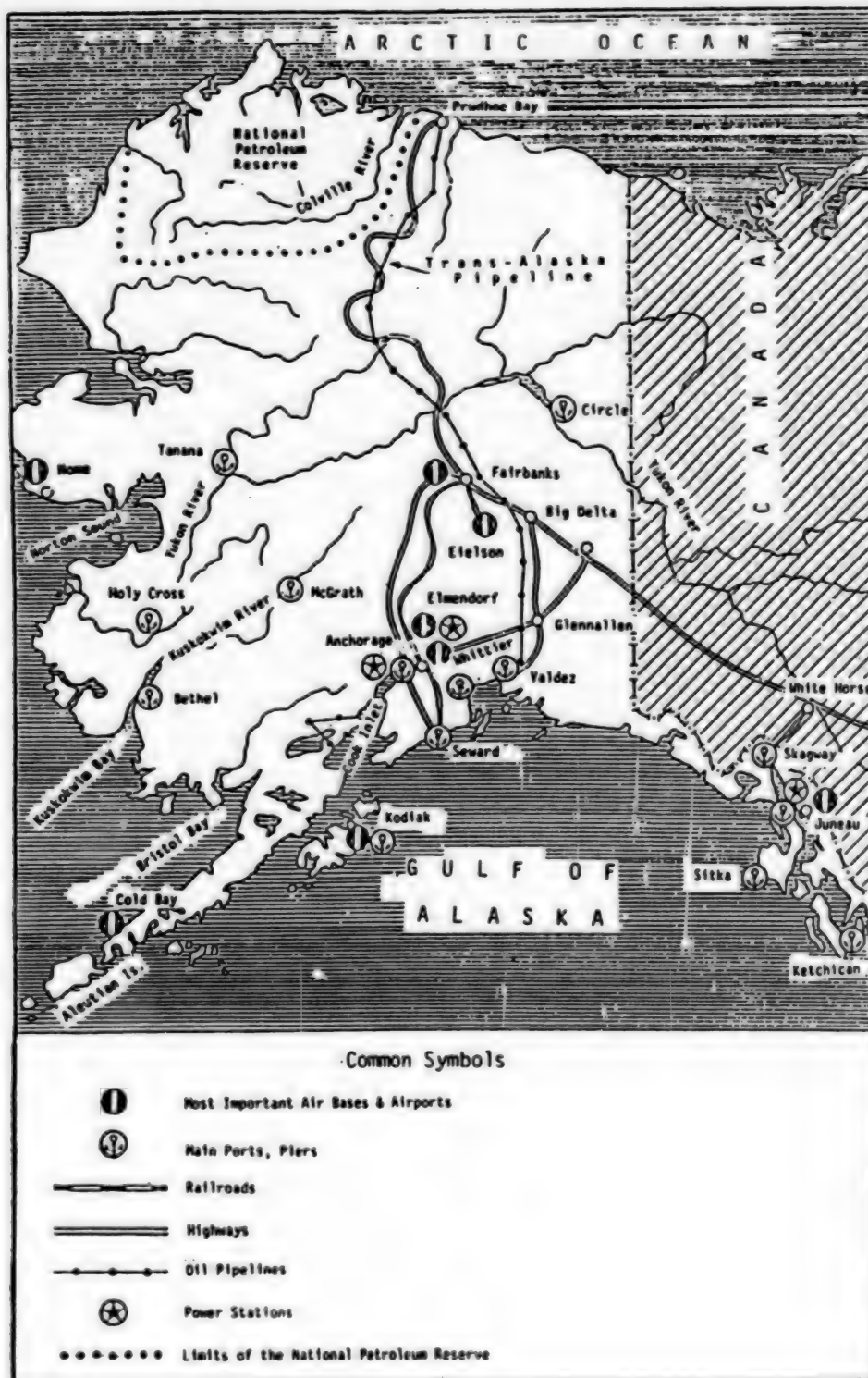
Alaska is the largest and least populated state in America. Its population is about half a million (0.2 per cent of the nation's population). The northern and central regions of the state are covered principally with plains and plateaus (up to 1,200 m above sea level), while the southern, southwestern and southeastern present mainly a mountainous relief. Characteristic features of the state are mixed weather and climatic conditions: extended polar nights

and a harsh winter. January temperatures are from -30° to -40°C , and on occasion reach -50°C . The lowest recorded temperature was -64°C . Frosty and dry weather prevails over the large part of Alaska. The northern coast has an Arctic continental climate with little precipitation. The greatest rainfall occurs in the southeast (3,000-4,000 mm, in places up to 6,000 mm a year, principally in winter and autumn.) It has sparse coniferous forests of the north Siberian type and tundra vegetation. The primary types of soil cover are: tundra, peat, and frozen Siberian. About four fifths of the territory is permafrost. A high level of seismicity has been noted in the area. All of this serves to restrain economic development of the state. Until now, despite the rapid tempo of mining useful ores in recent years, Alaska continues to be poorly developed economically. At the same time, judging by the saturation by defense items and by the level of their equipage, this state is well placed among the others (Figure 1).

According to the foreign press, forward staging bases are situated in Alaska for ground forces at Fort Stewart (near Fairbanks) and Fort Richardson(1) (near Anchorage), the training ground at Fort Greeley (not far from the Big Delta populated area), Elmendorf AFB (near Anchorage), Eielson AFB (near Fairbanks) and Shemya AFB (Aleutian Islands), U.S. Naval Base at Adak (Aleutian Islands), Coast Guard air and naval bases at Sitka and Ketchikan, and other bases for the armed forces.(2) In all, over 100 have been built (airfields, landing strips, naval bases, radar stations, etc). Along with modernizing the purely military installations, considerable attention is paid, as well, to developing other elements of the infrastructure. The transport network, communication lines and electricity transmission systems in Alaska have an extremely important significance for both the economy and the military forces. General purpose infrastructure installations such as airports, ports, communications nodes, connecting routes and others, have been built with a consideration for their potential usefulness for military purposes. The military-economic infrastructure grew at its highest tempo during the Second World War, as well as after that, when, at the end of the 1960s, oil and gas reserves, having strategic significance for the U.S., were opened.

Currently discovered Alaskan oil reserves are estimated at more than 1 billion tons, or more than one quarter of the total U.S. reserves. Ninety per cent of Alaskan oil reserves are located at the greatest deposit in North America, Prudhoe Bay. Here are concentrated great reserves of natural gas (about four fifths of the proven reserves are in Alaska), which consists of more than 970 billion cubic meters, or one fifth of U.S. gas reserves. Coal reserves are not large, but its extraction is maintained at a level sufficient to satisfy the general state economy and the military forces deployed there. The remoteness of energy resource reserves from its main consumers increases the importance of gas and oil delivery systems.

PIPELINES. Construction of a trans-Alaskan oil pipeline stretching 1,300 km (1.2 m diameter) was finished in 1977. It links Prudhoe Bay with the ice-free port of Valdez, on the coast of the Bay of Alaska. From this port tankers deliver oil to unloading points on the Pacific as well as the Atlantic coast of the U.S., as well as to ports in the Gulf of Mexico. Throughput capacity of the pipeline can reach 84 million tons a year. Twelve powerful pumping substations have been built along its route. A distinguishing feature of the



pipeline is a large number of artificial structures. There are about 800 different types of river and stream crossings. The general length of those sections which are underground is about 700 km. In order to maintain a normal production regime in warm months, parts of the ground in permafrost zones are cooled by a special solution flowing through supplementary pipes. In many places construction of the pipeline took into consideration requirements to be earthquake proof.

Although the acuteness of the problem of supplying the U.S. with oil has substantively lessened since the mid-1970s, the oil pipeline continues to play an important military-economic role. This is proven by the fact that the national legislature, under the rubric of "national security," and notwithstanding any economic benefit, forbids the exportation of oil to the nearby countries in the Far East. Furthermore, only tankers sailing under the U.S. flag are allowed to transport this oil to the continental U.S. Earlier plans for construction of a second leg of the trans-Alaska pipeline across Canadian territory have been shelved for an indefinite time.

A shorter pipeline is in place in the region of Cook Inlet, where oil is also extracted, but in considerably lesser quantities than in the north.

Further development of the pipeline network is tied to expanding efforts to extract oil in other deposits, including the continental shelf. Many of these are planned for hookup to the trans-Alaska pipeline. The U.S. politico-military leadership is paying much attention to conducting geological investigations for building places for deposits in far northwest Alaska, where the oil would be kept as a national oil reserve. Exploitation of this reserve would be done in time of war or break out of other extraordinary situations.

At the present time, Alaska extracts about 85 million tons of oil, annually. Part is refined at four local refineries. These (two on Kenai Island and one each near Fairbanks and in Prudhoe Bay) have a total capacity of directly refining 6.9 million tons of oil a year and essentially meet the state's requirements for fuel oil as well as bitumen, which is utilized in great quantities in road construction and repair, and in airfield landing strips.

For the last few years Alaska has significantly increased production of natural gas, which now amounts to almost 8 billion m³/year (1.5 percent of the entire U.S. production). At the same time, commercial development of the heaviest deposits in the Prudhoe Bay region is held back by the absence of means of transporting the gas into the internal parts of the country. It was earlier postulated that by 1985, a main pipeline would be constructed for transport of natural gas from Northern Alaska across Canada to the industrial centers of the continental U.S. A project was designed to construct a main pipeline 7,700 km long (of which 1,200 would be within Alaska) for delivery of 60 million m³ of gas every 24 hours. However, for all practical purposes, this project, as of now, has not even been started. A very small portion was built as a temporary variant in the north of the state which has no commercial significance. The main volume of gas produced is taken to the southern coast

(on the Kenai Peninsula), which is served by a fairly well developed, though not an extensive, gas pipeline network.

AIR TRANSPORT. At the present time, air transportation plays a very important role in satisfying economic and defense requirements by moving personnel and cargo around the state. A convincing example is the fact that in Alaska, more than in any other state in the U.S. more settlements (over 230) are linked by regular airlines. This active functioning air transportation system promoted development of a modern airport network. In all, there are more than 250 airfields in the state, including airports, airfields, and landing-takeoff strips. The largest airports and air bases; Anchorage, Fairbanks, Eielson, Juneau, Elmendorf, Cold Bay, and Shemya, have modern radio navigation, lighting and communications equipment which permit flight operations at night and under all weather conditions. These, as well as a number of other airports, are capable of receiving strategic aviation aircraft. Presently, the majority of them are used in one degree or other by the U.S. Air Force.

Alaska is linked by air routes to the continental U.S. into New York, Seattle, and Chicago. Also, international air routes pass through Alaska, linking the U.S. and Canada with Japan, South Korea and Western Europe. On the internal lines alone in Alaska more than 2 million passengers and 20,000 tons of cargo are transported.

The main portion of the number of air transportation fleet, numbering more than 3,000 units, is comprised of aircraft and helicopters of Alaska Airlines, Vien Airlines and Marker. In these airlines there are over 50 modern passenger and cargo aircraft made by Boeing and Douglas Aircraft. Their durability is assured by a dispersed network of military and civilian radar stations, technical bases, etc. These installations are located primarily in the Western part of the state, very close to Soviet borders.

The airport network of Alaska is under continuous modernization: ground equipment is being upgraded, runways lengthened and the quality of their surfaces being improved.

WATER TRANSPORTATION. The geographical situation and natural conditions of Alaska on the whole are favorable for water transportation development. The coastline is studded with inlets. The coastal regions in the southwest, south and southeast are characterized by large numbers of islands, bays and ice-free harbors. In all, in Alaska and in its island approaches about 20 seaports have been constructed which have a significance for the economy and for the forces deployed there, since the main bulk of cargo supplied to Alaska comes on waterborne transport. The largest in terms of cargo throughput, and the most modern from the point of view of technical equipment, is the specialized oil port of Valde, the terminal point of the trans-Alaska pipeline, and capable of handling up to 200,000-ton tankers.

Seward is another major seaport, serving as a transfer point for freight transshipped from there by rail. Others include Anchorage (with huge volumes of warehouses), Whittier (built as a searail terminal), through which materials and resources for the military bases in the internal regions of the state are transshipped, Juneau, Sitka and Ketchikan.

In the Aleutian Islands and in Alaska there are several prepositioning sites for navy equipment such as at Attu, Kiska, Sitka, etc., which were used in the Second World War. These points are accessible by virtually all classes of ships, have piers, and are equipped with pipelines for supplying warships with fuel oil and fresh water, and are adaptable for basing elements of fleet forces. The naval base at Adak in recent years has been used by major cutters and ships of the Coast Guard.

Work is continuous in upgrading seaports. According to the U.S. press, the volume of oil and oil products in Alaskan ports comprises almost 3 million m³.

The extent of internal waterways in the state is about 4,000 km. Shipping uses the Yukon River and its tributaries and the Kuskokwim River, which link the interior of Alaska with Canada and the Bering Sea basin. Under favorable conditions, navigation is possible from May to October. River docks and piers are not very large, but well equipped from a technical and navigational standpoint. Major ones are Holy Cross, Tanana and Circle--on the Yukon; and Betel and McGrath on the Kuskokwim. The small river fleet consists mainly of dry-cargo barges and small passenger ships.

VEHICLE TRANSPORTATION. There are about 10,000 km of roads for automobiles in Alaska, of which almost half are hard surfaced. The state is connected with the continental U.S. by the trans-Alaska Highway, which crosses Canada. It was built during the Second World War and terminates in Fairbanks. In conjunction with the opening of the oil reserves and construction of the trans-Alaska pipeline, an automobile highway was built parallel to the main line to the Arctic Circle. The road was without hard surface and was to be a continuation of the trans-Alaska highway, but not for general use. Traffic on the road is restricted to a brigade performing service and defense of the pipeline. Another segment of the highway, passing along the trans-Alaska pipeline links the Alaska highway with the port of Valdez. Most of this section lies above the Arctic Circle. There are practically no other highways north of Fairbanks. Automobile communications with outlying places is accomplished by snowmobiles (October to May). At the same time, which are used actively in summer are closed in the winter season for transportation. In the mountain-forested areas of southeast Alaska, there are hardsurfaced roads. Among these, the principal ones are the Seward-Anchorage-Fairbanks (traveling south to north) and the Anchorage-Glenallen-Tock road (from west to east up to the Alaskan Highway. The throughput capacity of the highway system is 305,000 autos a day. There are numerous local highways, including those used for support of the deployed units and detachments of armed forces.

One characteristic of the road system is a large number of man-made bridges and structures, trestles, culverts, causeways, etc., as well as the complexity of their utility due to harsh climatic conditions. Frequently, traffic is halted following snowfalls, icing over, or severe damage to the roadbed. Repair and maintenance of the roads in a usable condition is performed by special mobile road-repair gangs. Armed forces are often used for this purpose. Developmental plans for the auto road system include reconstruction of the Anchorage-Fairbanks Highway, continuation of construction of the Fairbanks-Nome Highway with a gravel surface, improvement of general road

surfaces, and widening the lanes of other roads. There are about 350,000 automobiles in Alaska, of which about 230,000 are light trucks.

RAIL TRANSPORTATION. According to the foreign press, there are now about 900 km of usable railroads in Alaska today. The single mainline in the state (whose wheelbase or gauge is 1,435 mm) is the state-run Seward-Anchorage-Fairbanks-Eielson line, a distance of 863 km. This is the main artery, linking the interior of Alaska with the state's southern coast, as well as serving a number of important military installations located in the area. The line's traffic capacity is about 30 steam trains a day. It carries, around the clock, freight as well as passengers, although almost one quarter of its length is in the permafrost zone. The mainline has several short branch lines, one of which goes to the port of Whittier, which is the beginning of the steamship passage to the cities of Prince Rupert (Canada) and Seattle.

From Skagway, in Southeast Alaska, a narrow-gauge line (1,000 mm) extends to the Canadian city of White Horse, which is on the trans-continental auto route. The rail line is 177 km long, of which about 30 km pass through Alaska. Its traffic capacity is about 10 trains a day. Other small narrow-gauge lines are practically no longer in use.

All the railroad lines in Alaska are single track, non-electrified. About 50 locomotives are employed on these lines, along with 1,500 freight and about 50 passenger cars.

As noted in the foreign press, the network of ground lines of communications in Alaska is insufficiently and unequally developed. The most dense system of rail and highways is in the south and central regions of the state. In the north and west there is practically nothing.

ELECTRICAL POWER. Alaska has more than 40 electrical power stations, whose total power, according to the U.S. press, is 1.3 million kilowatts (0.2 per cent of the entire U.S.). One peculiarity of the electrical energy base in this region is the fact that 90 per cent of the power is reserved for the state sector, wherein many power stations are continuously run for the armed forces and located on military installations. Electrical power production in the state exceeds 3.7 billion kilowatts a year. The largest power station (215,000 kW) is in the Anchorage area.

Hydroelectric resources in Alaska, estimated at 15 million kW, are virtually unused. The most powerful hydroelectric stations are in the area of Juneau (47,000 kW) and Anchorage (30,000 kW).

All electric power stations are situated in the south and central Alaska near heavily populated points. The power transmission network in these areas is well developed. Electrical service for military and industrial installations in the north and northwest areas of the state is furnished, as a rule, by means of diesel electric stations of local importance. The electrical power station at Fort Greeley, which belongs to the U.S. Army, has a nuclear power plant rated at 2,000 kW.

On the whole, Alaska, despite the increase in its role as a supplier of valuable, useful resources (oil and natural gas), continues economically to be primarily a supplementary supplier of natural resources. At the same time, the state is characterized by the presence of a large number of defense installations and a rather high level of development of the defense-economic infrastructure, serving in the first event to satisfy the needs of the forces stationed there and playing a large role in the preparation of Alaska as a staging area for aggressive U.S. imperialism in the Northern Pacific.

1. A detached infantry brigade is stationed at Fort Richardson which was the basis for the formation of the light infantry division.

2. For details concerning the deployment of forces to Alaska, see: Zarubezhnoye voyennoye obozreniye, No 10, 1986, pp 11-12. Ed.

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DANISH CIVIL DEFENSE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 83-88

[Article by Col (Reserve) V. Emelyanov; "Danish Civil Defense"]

[Text] Denmark's military-political leadership is examining measures to improve civil defense as an integral part of military preparations. In being an active member of the aggressive North Atlantic bloc, Denmark is developing civil defense within national bounds with consideration given to the recommendations of the NATO Civil Defense Committee, included within the main committee for the development of civilian emergency plans(1). The bloc's leadership is persistently pressing all its participants, including Denmark, to implement measures to further develop national civil defense systems and to prepare the population for actions when weapons of mass destruction are used.

As the Danish press has repeatedly emphasized, civil defense is considered to be an integral part of the so-called "total defense," which implies the implementation of an aggregate of military-political and economic measures, directed at the effective preparation of the armed forces, economy and population for war with both the employment of nuclear missile weapons and conventional means of armed conflict. Denmark's civil defense forces and equipment also are considered to be a reserve, which if necessary, can replenish troop losses or implement measures to support combat actions (military transport, the maintenance and restoration of communication lines, rescue operations at military sites, etc.

The development of Denmark's modern civil defense system began in 1949, after the adoption of the Civil Defense Law specifying its organizational structure and missions. Subsequently, new provisions have been added to this law. In particular, the function of protecting the population not only during wartime, but during peacetime has become part of the civil defense mission.

The main mission of Denmark's civil defense is the preparation and implementation of a complex of measures to protect the population. Stemming from this, the main efforts within the area of civil defense are directed at developing a network of antiradiation shelters for the population, improving the warning system, developing evacuation and dispersal plans, instructing the population on protection methods against weapons of mass destruction,

providing specific categories of civilians with individual means of protection from weapons of mass destruction, and the training and execution of rescue and emergency-restoration operations.

According to the mentioned law, the Civil Defense Directorate, organized within Denmark's Ministry of Internal Affairs, carries out the general leadership of civil defense. The directorate's chief is the chairman of the consultative body, the Civil Defense Council, created within the Ministry of Internal Affairs. The council includes representatives of the armed forces, police, the fire-prevention service, health services and community bodies. According to Western press information, during an emergency situation, it is planned to transform the Civil Defense Directorate into the National Civil Defense Command, which will execute the leadership of civil defense force activities through two zonal commands (The Eastern Zone and the Western Zone).

Denmark's territory is divided into seven civil defense districts, and the later into regions. Each city, large city-type population center or several population centers embodies a civil defense region. In all there are 102 such regions in the country. Part of the rural territory does not belong to one of the civil defense regions.

The civil defense leadership within the civil defense districts is entrusted to the chief of the city police of one of the bureaus (the administrative unit of Denmark, 14 in all), included in a given district.

Denmark's civil defense includes the Civil Defense Corps, local civil defense forces, and also services for Civil Defense Medical Aid Service and the warning of an enemy air attack and radiation contamination of the terrain, training institutions and other components.

The Civil Defense Corps represents a paramilitary organization and is intended for helping local civil defense forces. During peacetime it executes missions to eliminate the consequences of natural disasters and also large industrial accidents and catastrophies. The Civil Defense Corps is subordinated directly to the chief of the Civil Defense Directorate, and during peacetime consists of a headquarters and two brigades (the 1st Jutland Brigade and the 3rd Zeland Brigade).

The 1st Brigade includes three columns (the Northern Jutland, the Middle Jutland, and the Southern Jutland) and an independent section on Fyn Island. The 3rd Brigade includes two columns (the North Zeland and the Southern Zeland) and an independent section on Bornholm Island. Each column numbers approximately 200 men (except for the North Jutland column, in which there are 100 men). An independent section numbers 100 men. The columns include a headquarters and two sections, each of which has 6-8 cadre command personnel, 6-8 non-commissioned officers and approximately 80 enlisted personnel. In all, the TO&E of the corps numbers 1,300 men during peacetime. The corps also has 1,100 special equipment units at its disposal (fire vehicles, medical and technical aid, earth lifting cranes, bulldozers, compressors, decontamination units, pump units, etc.).

Alert subunits, which consist of 2-3 commanders and up to 24 enlisted personnel, exist at the columns' garrison deployment locations to execute urgent missions. The necessary equipment for fire fighting and rescue operations is at their disposal. The alert subunits are also assigned to the billeting locations of the sections.

According to Danish press information, during wartime the Civil Defense Corps is expected to have three fully mobilized brigades: the 1st Jutland (three columns and a section), the 2nd Copenhagen (three columns in Copenhagen and a section in Amager), and the 3rd Zealand (two columns and a section). The number of personnel is expected to reach 1,200 in each column, up to 550 in a section, and up to 13,000 men in the corps. Additionally the corps receives approximately 1,400 special vehicles. The general number of vehicles is 2,500.

During peacetime the Civil Defense Corps staff is comprised of draftees. The service time in the corps is eight months, but for personnel filling command positions (having undergone special training) it is twice as long. One thousand one hundred (1,100) men are drafted into the corps each year.

Exercises and subunit training is an important method of training the Civil Defense Corps personnel. The leadership element of the country's various civil defense components receive appropriate training in large-scale HELIX-type NATO exercises (conducted during even numbered years), and also during exercises of Denmark's "total defense" forces, both on a national scale, and at civil defense district levels.

The local civil defense forces include urban and rural civil defense organs, and municipal service, self-defense and police service formations located within the civil defense regional territory.

A civil defense regional chief (a chief of police) and a civil defense commission, headed by a city burgomaster, carries out the civil defense leadership in a region. It includes the civil defense regional chief, municipal leaders, police representatives and local public organizations. The civil defense commission organizes the activities of community service subunits, the construction and operation of public shelters and other protective structures. The commission coordinates the work of the self-defense service within businesses (bedriftsverna), city living quarters (kappeverna), and suburban regions (villaverna).

The services at the commission's disposal have technical equipment to fight fires, carry out rescue operations, and also communications equipment, dosimeter devices, medicine supplies and dressings, and resources to aid the victim population. In cities with a population of more than 20,000, detachments have also been created to fight natural disasters and eliminate their consequences.

Without fail, the self-defense groups of businesses operate at industrial enterprises with not less than 75 people. In all there are more than 2,000 enterprises in the country whose owners are responsible for creating and equipping such groups. The self-defense service of living quarters have also been created in dense quarters of cities. In all there are approximately 4,000

city quarters in the country in which it has been recommended to have self-defense groups. The government places fire pumps (primarily manual), stretchers, gas masks, protective helmets and glasses at the disposal of these groups. The remaining equipment is purchased by the residents. The self-protection service of suburban regions (villabernas) is organized on a volunteer basis in a region of suburbs and in a rural locality. The government provides these groups with manual fire pumps and stretchers. Other necessary equipment is purchased by the residents out of their own pocket.

In communities not included in civil defense regions, the rural community self-protection service can be formed from volunteers on the basis of volunteer fire brigades. Presently, there are approximately 1,300 rural community self-protection groups. All the equipment is purchased by the residents.

Prior to 1963, the staff of local civil defense forces was comprised exclusively of volunteers. However, due to their inadequate numbers, an amendment was introduced into the Civil Defense Law in 1963. Now people are drafted into local civil defense forces who are able to perform duty, but for various reasons are not drafted either into the armed forces, into the "Hemvern" (an auxiliary paramilitary organization), or into the Civil Defense Corps, and also persons crossed off the military register, but who are healthy enough to perform service. Local civil defense forces also include personnel serving in the Civil Defense Corps but are not called up during mobilization. Besides draftees and volunteers, a large number of civil community services also comprise the local civil defense forces.

The number of personnel in local civil defense forces exceeds 65,000 men, including 14,000 volunteers and civil community enterprises, and 51,000 people in the local civil defense forces, and also serving in the civil Defense Corps.

The Medical Air Service is concerned with medical support to the population in emergency situations. A committee for training the civilian nursing institutions for the transition to a wartime posture guides its activities. It is responsible for creating and maintaining medical stations, the expansion of a large hospital network and the deployment of auxiliary field hospitals. The Civil Defense Medical Aid Service's primary mission is to provide first aid to wounded and burned persons, and their assembly and evacuation to medical points, hospitals and field hospitals.

The Civil Defense Directorate, in cooperation with the National Health Directorate, implements measures to insure medical readiness, including the creation of medical supplies and the preparation of equipment for the deployment of additional medical institutions. In recent years, civil defense organs have purchased equipment and medicines estimated to support 25,000 persons, and also 600 surgical equipment operating sets. There are also 50 equipment sets for deploying auxiliary field hospitals designed for 200 beds each.

As the Danish press notes, an auxiliary field hospital is intended primarily to provide surgical aid. Its equipment weighs approximately 45 tons and is

contained in a packing designed for a long storage life. During exercises, it was confirmed that an auxiliary field hospital can be completely deployed within 24 hours, for example, in school buildings. Its equipment includes four operating tables and X-ray and anesthesiology equipment.

Currently there are more than 40,000 beds in Danish hospitals and approximately 90,000 medical personnel. During wartime, it is planned to increase the number of beds to 60,000. There are also more than 2,500 ambulances at the disposal of civil defense organs.

As the Western press reports, the service for the warning of enemy air raids and the radioactive contamination of the terrain has been created within the Danish civil defense system. Information on the situation is received from the Danish Air Defense Sector Operations Center (Karpun) and seven air defense observation and warning posts included in the joint NATO air defense system, NADGE. They are tied to civil defense district and regional control posts and command posts. The alert signals can be sent via electronic sirens (approximately 700 sirens), and also by church bells and mobile units with manually operated or gas engine operated sirens. Each Wednesday at 1,200 noon an actual operational test of the sirens is carried out in Denmark.

As the Western press reports, fixed ground and mobile dosimeter monitoring posts (in all, it is planned to deploy 400 of them) must issue information on the radioactive contamination of the country's territory. In cities, it is planned to warn of radioactive fallout in two stages: first, a preliminary signal indicating the threat of radioactive fallout must be issued using sirens and then, also by sirens, signals concerning the fallout. In a rural locality, only a preliminary signal will be issued and further information is reported via radio.

Defense structures for the population in the civil defense system includes both public and private dugouts and shelters. The Danish government decided to develop a network of anti-radiation shelters in the country in 1950.

Part of the public shelters (more than 4,000) currently in existence are primarily refurbished bomb shelters from the Second World War having a capacity of up to 500 people each. Their general capacity is approximately 200,000 spaces. Large dual purpose public shelters have also been erected. During peacetime they are used as garages, warehouses, shooting ranges, sport buildings etc. However, if necessary, they can be reequipped as shelters in a short time. Their total capacity is 290,000 spaces.

It is also planned to use equipped basements of private institutions, businesses and dwellings (more than 27,000 with a general capacity of approximately 2.5 million spaces) as shelters. They exist in 129 communities (out of 275) which also have the responsibility for developing such shelters and keeping them in proper condition. In the remaining 146 communities, the local authorities are not required to maintain private shelters. Nevertheless, Danish civil defense specialists figure that these communities have the capability to shelter approximately 330,000 people in building basements after their slight renovation. In all, more than 3.3 million persons, or more than

60 per cent of the country's population can be accommodated in public and private shelters.

Denmark's government and civil defense leadership, in considering anti-radiation shelters to be the main means of protecting the population from weapons of mass destruction, simultaneously plan to evacuate the population from threatened regions, first from cities with a population of more than 10,000 inhabitants. Depending on the situation, evacuation can be carried out over a near or long distance, completely or partially, rapidly or in stages.

In a combat operations zone, the civil defense regional chief executes a near evacuation upon the order of or on the authority of the corresponding military chief. A senior military chief in the combat operations zone, and for the residents of Copenhagen, the government, makes the decision for evacuation over a long distance. Without fail, evacuation plans exist for all civil defense regions. In communities, not included in a civil defense region, plans for accommodating evacuees are developed. In accordance with the Civil Defense Law, if necessary, the entire population is obligated to provide their dwellings and other buildings for evacuees, and in a number of cases, to provide them with food. Denmark's military-political leadership considers, that the evacuation of the population will be carried out primarily on a volunteer basis.

The cooperation of civil defense organs with the armed forces is regulated by law. Accordingly, the latter is responsible for providing extensive support to civil defense organs in the implementation of civil defense measures. Cooperation is organized primarily with regard to warning and evacuating the population, and in executing emergency rescue operations. Several armed forces subunits and units can be placed at the disposal of civil defense organs during an emergency. In turn, the command issues missions to civil defense organs in a combat operations zone and uses their forces and equipment to resolve individual problems. Joint plans exist for all levels of cooperation.

The leadership component of civil defense carries out training in two training institutions. The leadership component of civil defense, the chiefs of community services and police officers who deal with civil defense matters train at the Higher Civil Defense School (Snekkersten). Special courses and seminars are also organized for the leaders of business self-protection services and representatives of the Red Cross Society. Leaders of local civil defense forces are trained in the Civil Defense Technical School (Tinglev). The school has a special range for various trainers and equipment tests, which the Civil Defense Corps also uses regularly to organize various exercises.

The Medical Aid Service trains its cadres at the Civil Defense Medical School in Nestved. The training course lasts 800 hours over a period of 5 months.

The training centers for the training of non-commissioned officers of the Civil Defense Corps are located at Bernstorff Slot (a suburb of Copenhagen) and Herning. The training of enlisted personnel is carried out in the columns (independent sections) over 8 months and is divided into beginning, basic, and special training.

The retraining of personnel assigned to the Civil Defense Corps reserves is carried out in yearly gatherings lasting three weeks for the non-commissioned personnel and two weeks for enlisted personnel.

The personnel drafted into local civil defense forces are trained over a period of a month in the columns and independent sections of the Civil Defense Corps, where they study the principles of fire fighting and conducting rescue operations. After this, they are returned to prior pursuits and over the next two years undergo additional training lasting 50 hours per year.

The public organization, the " Civil Defense Union" conducts propaganda among the population concerning the necessity of civil defense and preparation for it regarding several issues. It functions on the basis of an agreement with the ministry of internal affairs which specifies its missions. This organization helps the authorities in enlisting volunteers and executes other civil defense missions. The government provides financial aid to the union.

The Civil Defense Union cooperates with the Red Cross Society in training volunteers to provide medical first aid and the basics of fire fighting. They publish the CIVIL DEFENSE JOURNAL, which is published 6 times a year with a run of 19,000 copies. Civil defense propaganda months are carried out each year in the country, brochures are published and lectures and reports, exhibitions and film demonstrations are organized. The Civil Defense Union arranges its own mobile exhibition.

A volunteer women's organization (approximately 14,000 women) has also been created. The women who join it undergo 24 hours of training in medical first aid and fire fighting. Additionally, they may receive training to work as communication personnel and senior billeting officers, etc.

In all, as the Danish press reports, the country's civil defense forces can enlist approximately 150,000 personnel, who have received various training to execute the missions placed before them.

Denmark's Civil Defense Directorate works with the civil defense organs and services of other countries, primarily with the Scandinavian countries. The chiefs of the civil defense directorates of these countries meet on a regular basis twice a year. Since 1953, Denmark has actively participated in the work of NATO's Civil Defense Committee.

As a whole, as the Danish press notes, the country has a diverse civil defense system at its disposal. The primary component is the Civil Defense Corps.

1. For a similar article on the NATO Civil Defense Committee, see Zarubezhnoye voyennoye obozreniye, No. 8, 1981 pp 23-25 (ed.)

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SOUTH KOREAN GUIDED MISSILE FRIGATES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 89-90

[Article by Capt 1st Rank Yu. Yurin; "South Korean Guided Missile Frigates"]

[Text] The ULSAN-Class guided missile frigates are, at present, among the largest South Korean-built surface combatants.(1) This multipurpose ship is being used to execute a wide range of missions during combat actions at sea.

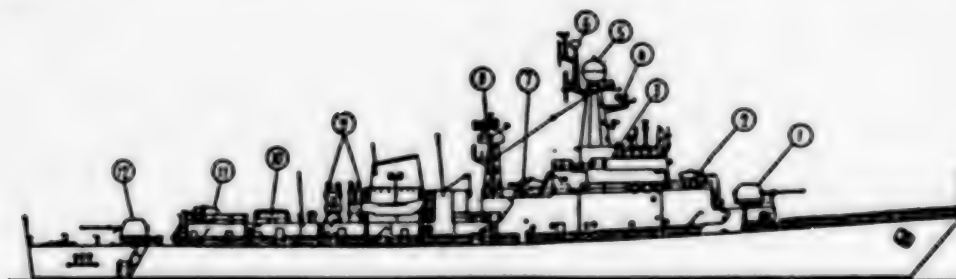
The lead guided missile frigate of the series was transferred to the Korean Navy at the beginning of 1981. The design was developed with active cooperation of American specialists. To the present, a total of five such ships have been built: ULSAN FF951, SEOUL FF952, CHUNNAM FF953, MASAN FF955, KYONBUK FF956. Additionally, one more of this class will be built. In its basic elements and characteristics, weapon suite, and the principles of its arrangements, the ULSAN-Class guided missile frigate is in many ways similar to this type of ship in other foreign navies.

Their standard displacement is 1,600 t; full, 2,000; length, 102 m; beam, 11.5 m; draft, 3.4 m. The steel hull is divided into 11 compartments by watertight bulkheads and is equipped with roll stabilizers. The flush-deck hull amidships has a built-up superstructure of light alloys with one stack. Portholes are practically non-existent and all compartments are equipped with air conditioning systems.

A tower-like mast rises above the navigation bridge, on which the HSA WM-28 fire control radar antenna (under a radio transparent cupola), the HSA ZW-06 surface search radar, and also the TACAN radio navigation system antenna (on the mast head) are mounted. The HSA DA-05 air search radar antenna, co-located with the IFF system, is mounted on a second mast. The ship has a CIC in which is installed a keel-mounted HSA PHS-32 medium frequency sonar. There are four six-tube launchers for firing Mk36 dipole reflectors (on each side of the navigation bridge), various means of electronic reconnaissance and EW, and also navigation and communications systems.

Two 4-tube HARPOON anti-ship missile launchers (firing range, 130 km) are mounted aft of the stack. There are two 324-mm Mk32 triple-tube torpedo mounts located on both sides of the after part of the superstructure (they fire the

Mk44 and 46 torpedoes). The ship's gun battery comprises two (bow and stern) single barrel 76-mm Mk75 OTO MELARA gun, and also four twin 30-mm EMERLEC anti-aircraft guns, mounted on the superstructure: one each on the bow and on the stern and one on either side, aft of the navigation bridge. On the stern there are two pairs of rails, each for six depth bombs or mines. A peculiarity of the ULSAN-Class guided missile frigates' ASW suite is the absence of the rocket launchers and ASROC. The arrangement of the ship's weapons is shown in the drawing.



South Korean ULSAN-Class Guided Missile Frigate

- | | |
|--|---|
| 1. Bow 76-mm OTO MELARA gun. | 8. HSA DA-05 air search radar. |
| 2. Bow twin-barrel 30-mm EMERLEC anti-aircraft gun. | 9. Two 4-container HARPOON anti-ship missile launchers. |
| 3. 6-Barrel launcher for firing dipole reflectors. | 10. Two 324-mm triple-tube torpedo mounts. |
| 4. HSA ZW-06 surface search radar | 11. Bow twinbarrel 30-mm EMERLEC anti-aircraft guns. |
| 5. HSA WM-28 fire control radar. | 12. Bow 76-mm OTO MELARA gun. |
| 6. TACAN antenna. | |
| 7. Two twin-barrel 30-mm EMERLEC anti-aircraft guns. | |

The South Korean ULSAN-Class guided missile frigate is equipped with a CODOG-type combination twin shafted power plant, which includes two General Electric LM-2500 gas turbines for full speed and two MTU 16V538 diesels (produced in South Korea under license from West Germany). Each turbine has a short-time maximum power of 27,000 hp, and maximum extended-time power is 20,000 hp (on one diesel it is 3,400 and 3,130 hp respectively). The ship's electrical power is fed from four 400 kW generators. Maximum speed is 35 kts, and range at an economical speed of 18 kts is 4,000 miles.

There is an 125-man crew, including 14 officers, 13 petty officers and 98 non-rated men.

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FOREIGN MILITARY CHRONICLE

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 12, Dec 86 (Signed to press 9 Dec 86) pp 91-92

U.S.

TOMAHAWK cruise missiles were test launched from a MK41 launcher installed on board the experimental ship NORTON SOUND. Each launcher was rated at 61 TOMAHAWK, STANDARD missiles and the ASROC ASW missile.

The firm LVT Aerospace and Defense was chosen as the prime contractor for the development of the army missile system for the prospective RUK. The initial contract was concluded in the amount of 180.3 million dollars. The total program cost is valued at roughly 3 billion dollars.

A contract was concluded with Bell (valued at 223.3 million dollars) for the production of 44 OH-58D reconnaissance helicopters for the army.

The army now has 364 OH-6 reconnaissance and observation helicopters.

Litton has been given an order to produce, for the U.S. Army, 70,000 night vision devices at a total cost of 278.8 million dollars.

The army has placed a additional order for 3,966 M242 25-mm automatic cannons which will be the main armament of the M2 BRADLEY IFV. By the beginning of this year, about 3,000 such cannons had been provided, and the total order comprises 7,842 units. Contract cost is more than 150 million dollars.

The output of the UHF radio sets, developed by ITT in the SINCGARS program, is being delayed for a year or more because of technical problems. Their production had already begun, and by the beginning of 1987, it had been planned to issue about 1,000 units. The program called for the production of more than 290,000 such radio sets. The total cost of their development and purchase is valued at 5.5 billion dollars.

The 1,000th F-16 FIGHTING FALCON tactical fighter, or the 1,572nd aircraft since the beginning of its series production has been delivered to the U.S. Air Force. Of the total number of fighters produced, 1,178 were built in the U.S., 216 in The Netherlands, and 178 in Belgium.

It is planned to acquire 125 of the new modification P-3D ORION shore-based patrol aircraft for the navy. It is expected that delivery will be completed in 1989, with 23 aircraft being delivered annually.

The American government, as announced by Secretary of State, G. Shultz, is breaking military ties with New Zealand as a consequence of an agreement concerning the ANZUS pact and because of its anti-nuclear policy.

GREAT BRITAIN

A combat vehicle has been created, based on a new BMP MCV-80, for action under desert conditions (it is equipped with the American 25-mm cannon, the landing compartment accommodates seven infantrymen and has gun ports for conducting fire: three on each side and one in the rear door) and a breakdown and evacuation vehicle (it has a 7.62-mm machine gun, a hydraulic crane and other equipment).

More than 200 new TORNADO tactical fighters were supplied to the royal air force by mid 1986. Ten squadrons (including one in joint training center in Kottesmore) were armed with them. In all, it is planned to have 385 aircraft of this type, of which 220 will be TORNADO-GR.1 strike aircraft and 165 TORNADO-F.3 fighter-interceptors.

Sixteen ASW helicopters have been ordered for the royal navy aviation including ten HAS.4 SEA KINGS and seven HAS.2/3 LYNX.

The shipboard UAF-1 EW set, in the ZU which store radar's 2,000 parameters, analyzes and classifies radar signals intercepted in the 1-18 GHz band.

FRG

The ministry of defense has decided to order an additional 150 LEOPARD-2 tanks for rearming the 10th Tank Division, which is presently equipped with the LEOPARD-1A4 tank. Delivery of the LEOPARD-2 tanks will be carried out from January 1988 through January 1989 (a total of 250 units is envisioned for this division). It is expected that another 400 LEOPARD-2 tanks will be ordered and their total number in the bundeswehr will be brought up to 2,400 (until now, 1,000 tanks have been ordered).

The bundeswehr's school of psychological warfare was transferred from Oyskirkhena to Valdbryol in mid-1986. In connection with the growing missions for the psychological personnel training school,

FRANCE

Tests of the new MISTRAL air defense guided missile (ZUR), developed by Matra, are continuing. In a routine test launch, the ZUR scored a direct hit on the target, a CT-20 airborne drone, flying head-on at an altitude of about 150 m. MISTRAL (launch weight, 18 kg, warhead weight, 3 kg) is intended for destroying low-flying air interceptor-type targets at a range of up to 6 km and a hovering helicopter at 4 km. Introduction of the ZUR into the French Air Force is expected in 1987.

ITALY

Two helicopter-dock landing ships, SAN GEORGIA and SAN MARKO, are being built for the Italian Navy. Their tactical-technical characteristics are: full-load displacement, 7,665 t; length, 118 m; beam, 20.5 m; draft, 5.3 m; 16,800 hp twin-shafted diesel power plant; maximum speed, 21 kts; range at 16 kts, 7,500 nm. Their landing capacity is 400 marines, 36 APCs, and 6 landing craft or the same number of marines and 30 medium tanks. The basing for three helicopters is provided. Armament: a 76-mm single-barrel OTO MELARA gun mount and possibly two 30-mm anti-aircraft gun mounts. The SAN GEORGIA is expected to be commissioned in 1987.

CANADA

It is planned to arm with the new CF-18 tactical fighter, the 416th and 441st Air Squadrons and the training-combat subunit (Cold Lake, Canada Air Base), and also the 425th and 433rd Air Squadrons (Bagoville, Canada, in addition to the 409th, 421st and 439 from the 1st Air Group (Zolingen, FRG Air Base). At the same time, of the 138 aircraft of the same type which have been ordered, it is proposed to have 98 single-place CF-18A fighters (earlier contemplated at 110) and 40 two-place CF18B trainer-combat aircraft (28).

BELGIUM

The country's government has made the decision to increase the period of service by two months. In connection with this, Belgian servicemen serving in the FRG will be there not eight months as fixed now, but ten months. The law became effective in 1987.

DENMARK

Parliament has approved ear-marking 2,200 million Danish Krona for the purchase of munitions and military equipment in 1986-1993.

TP-61 torpedoes have been ordered from FFV, a Swedish amalgamated state factory, for the sum of 26.6 million U.S. dollars. They will be wire-guided and have, additionally, a homing system and will be able employed from surface ships and submarines. The warhead weight is 250 kg.

NORWAY

The government has requested parliament, in the draft 1987 state budget, that 17.25 billion Norwegian Krona be allotted to the ministry of defense. In 1986, the military department's budget was 15.9 billion.

SPAIN

Construction of the first state factory for the production of turbojet aircraft engines is planned. For its construction, 15 billion pesetas will be spent over a two-year period.

NATO

Spain, which from 1982 until the present, has enjoyed the status of an observer, made an announcement concerning its full participation in the NATO nuclear planning working group. As is well known, Spain does not participate in the bloc's military organization.

A NATO exercise code-named BRAVE LION was conducted in September 1986 in northern Norway. About 5,500 Canadian servicemen participated in it. Worked out in the exercise were questions concerning the transfer of Canadian forces and freight to northern Norway by air and sea, and the conduct of combined military operations, cooperation, etc.

The NATO scientific research ship ALYANSE, designed to study ASW problems was launched in July 1986, in Italy. It is planned to commission it in October 1987. It will be based at the NATO ASW scientific research center at La Spezia (Italy). The ship displaces 3,200 t; maximum speed, 17 kts; range, 800 nm at 12 kts. The crew is 30 men (Italian) and 20 scientists from various bloc countries.

SWEDEN

The BOFORS RBS-56 ATGM BILL, has been placed in army service. Range of fire is up to 2 km.

An order has been placed for the production of the new TP431 small-size torpedo (diameter, 406 mm). It is wire-guided and uses a homing system. It will enter service in surface ships and submarines.

SWITZERLAND

The country's air force specialists are testing the French ALFA JET training-combat aircraft and the British HAWK in order to make a decision concerning the selection of the future aircraft to replace the obsolete DHC-115 VAMPIRE (it entered service in 1958).

The purchase of the last 60 RAPIER air defense guided missile batteries (the first models were introduced in 1984), ordered in Britain, was completed in mid-1986. The missiles for these batteries should be delivered by the end of 1987.

EGYPT

The first four French MIRAGE-2000, two single-place MIRAGE-2000EM and two two-place MIRAGE-2000BM have entered service in the Egyptian Air Force.

ISRAEL

Ground tests are continuing of the first experimental model of the new LAVI multipurpose tactical fighter (developed and built by the firm, Israel Aircraft Industries). At the same time, the operation of the power plant (in all modes), the electrical, hydraulic and other aircraft systems are being tested.

NT37E torpedoes, which are produced by the Israeli firm Tadiran, with Westinghouse's participation, has been ordered for the Israeli Navy.

The fourth modification of the GABRIEL anti-ship missile (range, 200 km), is being developed.

SAUDI ARABIA

The government plans to base its forces in Kuwait in the event Iran threatens to intrude there.

UNITED ARAB EMIRATES

The country's leadership is planning to build a naval base on the Island of Tabelakh, 75 km northeast of Abu Dhabi. The construction of the new military facility is necessary, as explained by the navy command, for the defense of the oil fields.

JAPAN

Two Minesweepers, KAMICIMA MSC664 and KHIMESIMA MSC665 (the 16th and 17th of the KHATSUSIMA-Class), were delivered to the fleet in December 1986. They will join the new 18th and 17th Divisions of the 1st and 2nd Flotillas, respectively.

SINGAPORE

The first 3 (of 22 ordered in France) AS.332M SUPER PUMA helicopters, being used for submarine detection and for search and rescue, have entered the country's air force inventory. Final delivery of the remaining helicopters is planned for 1987.

AUSTRALIA

In the near future, it is planned to have the Austrian SIG-7 5.56-mm rifle in place of the L1A1 (7.62-mm) and ML6A1 (5.56-mm) automatic rifles and also the 9-mm sub-machine gun (67,000 will be manufactured at state enterprises on licence).

BRAZIL

The firm Bernardini has received an order for the production of 50 MB-3 TAMOYO tanks with their subsequent delivery to the army. The new tank has a combat weight of about 30 t; hull length, 6.5 m; width, 3.2 m; height, 2.5 m; and a three-man crew. The main armament is a 105-mm rifled gun. The power of the diesel engine is 500 hp; maximum road speed, 67 kmph; radius of action, 550 km.

SALVADOR

Personnel strength of the army is approximately 39,000; air force, 1,500; navy, 500; and 600 in the marine corps.

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